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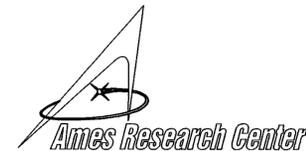
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DWG NO. A1---0810-G1 SHT REV

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 AMES RESEARCH CENTER
**RESTORATION
 OF
 ELECTRICAL DISTRIBUTION SYSTEM
 PHASE VIII**



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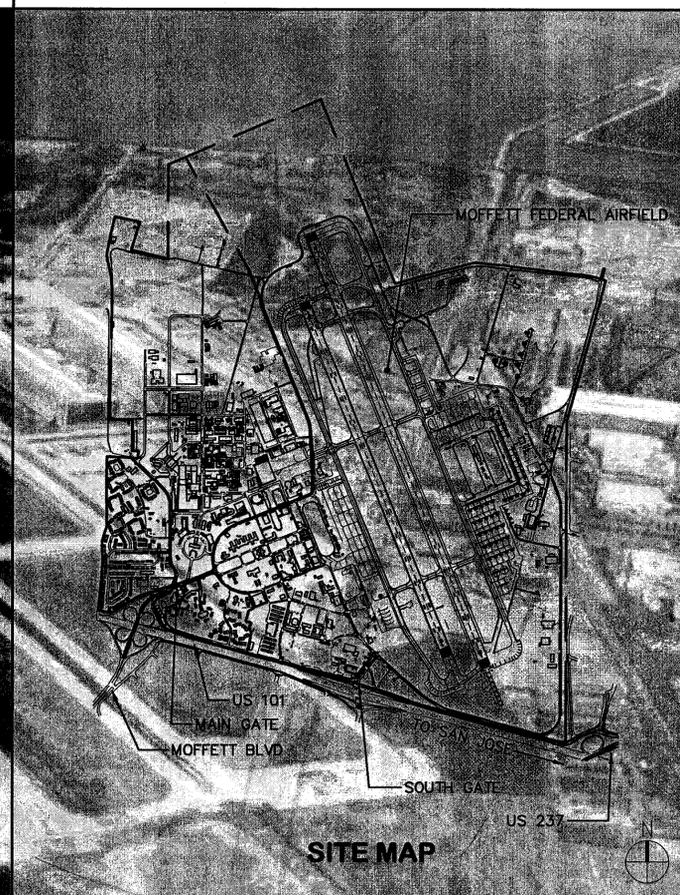
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Approved for Construction
 Moffett Field Permit Board
[Signature]
 Chief Building Official
 Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DRAWN	P.A.	DATE	4/30/09		
DESIGNED	N.NIZAMOVA	DATE	4/30/09		
CHECKED	J.MCCUSKER	DATE	4/30/09		
PROJ.MGR	N.NIZAMOVA	DATE	4/30/09		
REQUESTER	N.HSU	DATE	4/30/09		
R&QA		DATE			
SAFETY					
SUPERVISOR					
S.FRANKEL	<i>[Signature]</i>	DATE	4-30-09		

Ames Research Center
 Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
 GENERAL

TITLE SHEET

SIZE	D	CAGE CODE	25307	REV	
SCALE:		INDEX		SHEET	OF
FILE NAME:	A1---0810-G001_1_R8.DWG 4-30-09				

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DWG NO. A1---0810-G2 SHT 1 REV

LOCATION MAP

PROJECT TITLE

REDS PHASE VIII

SCOPE OF WORK

1. N202 & N202A NEW BUILDING SUBSTATION (BASE BID).

- a) DISCONNECT, PULL OUT AND DISPOSE INCOMING CABLES FROM N203 SUBSTATION TO THE BUILDINGS N202 AND 202A.
- b) PROVIDE DUAL VOLTAGE TRANSFORMER RATED 750kVA 13.8x7.2kV-480Y/277V.
- c) PROVIDE 15kV SWITCHGEAR.
- d) PROVIDE 15kV INCOMING CABLES FROM SW-464 (WAY # 3) TO NEW 15kV SWITCHGEAR.
- e) PROVIDE 480Y/277V DISTRIBUTION SWITCHBOARD.
- f) REPLACE (E) 225kVA 480-208Y/120V TRANSFORMER IN BUILDING N202 WITH NEW ONE.
- g) PERFORM FIELD TESTING OF NEW EQUIPMENT TO THE SATISFACTION OF THE CONTRACTING OFFICER.
- h) PROVIDE SHRUBS.

2. N203 & N204 BUILDING SUBSTATION UPGRADE (BASE BID).

- a) REMOVE AND REPLACE EXISTING TRANSFORMERS T119 AND T120 WITH A SINGLE DUAL VOLTAGE TRANSFORMER RATED 750kVA 13.8x7.2kV-480Y/277V AND THAN STEP DOWN TO UTILIZE VOLTAGE 208Y/120V.
- b) REMOVE AND REPLACE EXISTING 6.9kV SWITCHGEAR WITH 15kV SWITCHGEAR.
- c) REMOVE AND REPLACE EXISTING LOW VOLTAGE DISTRIBUTION SWITCHBOARDS.
- d) REMOVE & REPLACE MEDIUM VOLTAGE INCOMING CABLES FROM SW-464 TO SWITCHGEAR WITH 15kV CABLES AS INDICATED ON DRAWINGS.
- e) REMOVE AND DISPOSE OF ASBESTOS AND LEAD PER CAL-OSHA REGULATIONS, FEDERAL OSHA REGULATIONS AND NASA SPECIFICATION 02080.
- f) PERFORM FIELD TESTING OF NEW EQUIPMENT TO THE SATISFACTION OF THE CONTRACTING OFFICER.

3. N210 BUILDING SUBSTATION UPGRADE (BASE BID).

- a) REMOVE EXISTING 750kV TRANSFORMERS T75 & T76 AND REPLACE WITH SINGLE DUAL VOLTAGE TRANSFORMER RATED 1500kV 13.8x7.2kV-480Y/277V.
- b) REPLACE EXISTING SWITCHGEAR WITH NEW 15kV SWITCHGEAR.
- c) REMOVE EXISTING PULL BOX WITH SWITCH.
- d) REMOVE PART OF EXISTING INCOMING CABLE FROM MH E18 TO EXISTING SWTHGEAR, PROVIDE NEW CABLE TO MATCH EXISTING AND SPLICE IN EXISTING MH E18.
- e) PERFORM FIELD TESTING OF NEW EQUIPMENT TO THE SATISFACTION OF THE CONTRACTING OFFICER.

4. N221 BUILDING SUBSTATION UPGRADE (ADDITIVE 1)

- a) REMOVE AND REPLACE EXISTING TRANSFORMER T130 WITH A DUAL VOLTAGE TRANSFORMER RATED 500kVA 13.8x7.2kV-208Y/120V.
- b) REMOVE AND REPLACE EXISTING TRANSFORMER T15 WITH A DUAL VOLTAGE TRANSFORMER RATED 1000kVA 13.8x7.2kV-480Y/277V.
- c) REMOVE AND DISPOSE OF ASBESTOS AND LEAD PER CAL-OSHA REGULATIONS, FEDERAL OSHA REGULATIONS AND NASA SPECIFICATION 02080.
- d) PERFORM FIELD TESTING OF NEW EQUIPMENT TO THE SATISFACTION OF THE CONTRACTING OFFICER.

5. N221B BUILDING SUBSTATION UPGRADE (ADDITIVE 2)

- a) REMOVE AND REPLACE EXISTING TRANSFORMER T172 WITH A DUAL VOLTAGE TRANSFORMER RATED 1500kVA 13.8x7.2kV-480Y/277V.
- b) REMOVE AND REPLACE EXISTING TRANSFORMER T173 WITH A DUAL VOLTAGE TRANSFORMER RATED 300kVA 13.8x7.2kV-208Y/120V.
- c) REMOVE AND REPLACE EXISTING 6.9kV SWITCHGEAR WITH 15kV SWITCHGEAR.
- d) PROVIDE NEW 15kV SWITCHGEAR FOR INSULATION TRANSFORMERS.
- e) REMOVE AND REPLACE EXISTING LOW VOLTAGE DISTRIBUTION SWITCHBOARDS.
- f) REMOVE & REPLACE MEDIUM VOLTAGE INCOMING CABLES FROM SW-454 TO SWITCHGEAR WITH 15kV CABLES AS INDICATED ON DRAWINGS.
- g) REMOVE AND DISPOSE OF ASBESTOS AND LEAD PER CAL-OSHA REGULATIONS, FEDERAL OSHA REGULATIONS AND NASA SPECIFICATION 02080.
- h) PERFORM FIELD TESTING OF NEW EQUIPMENT TO THE SATISFACTION OF THE CONTRACTING OFFICER.

6. N226 BUILDING SUBSTATION UPGRADE (BASE BID).

- a) REMOVE AND REPLACE EXISTING 6.9kV SWITCHGEAR WITH NEW 15kV SWITCHGEAR.
- b) REPLACE FEEDER FROM SWITCHGEAR TO TRANSFORMER T13 WITH 15kV CABLES.
- c) REMOVE AND DISPOSE OF ASBESTOS AND LEAD PER CAL-OSHA REGULATIONS, FEDERAL OSHA REGULATIONS AND NASA SPECIFICATION 02080.
- d) PERFORM FIELD TESTING OF RELAYS AND NEW BUILDING EQUIPMENT TO THE SATISFACTION OF THE CONTRACTING OFFICER.

NOTE: SCOPE OF WORK PROVIDED HERE IS FOR REFERENCE ONLY. REFER TO DRAWINGS FOR SPECIFIC SCOPE OF WORK.

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DATE	BY	DESCRIPTION
4/30/09	[Signature]	DESIGNED
4/30/09	[Signature]	CHECKED
4/30/09	[Signature]	PROGRM
4/30/09	[Signature]	REQUESTER
4/30/09	[Signature]	R&Q

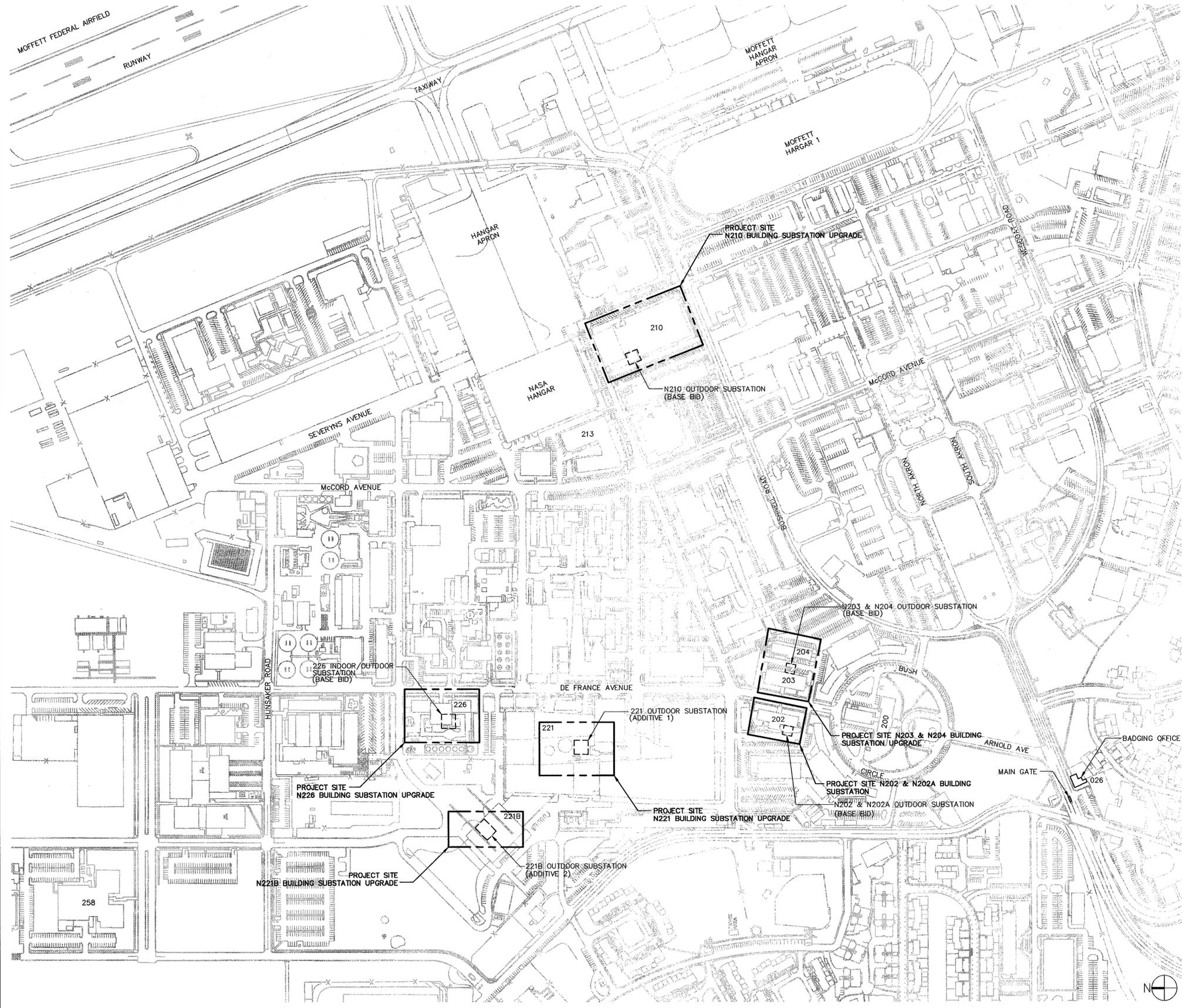
Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM—PHASE VIII
GENERAL

LOCATION MAP AND SCOPE OF WORK

SAFETY	DATE	SIZE	CAGE CODE	INDEX	SHEET	1 OF 1
SUPERVISOR	S. FRANKEL	DATE	5/25/09	D	25307	A1---0810-G2
SCALE:						

FILE NAME: A1---0810-G002_1_R8.DWG 4-30-09



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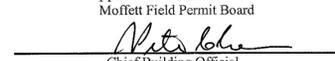
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DRAWING INDEX ~ REDS PHASE-VIII

NASA NO.	SHEETS	DESCRIPTION	REV	NASA NO.	SHEETS	DESCRIPTION	REV																																																																																																																																																																			
GENERAL				N210 OUTDOOR SUBSTATION UPGRADE (BASE BID)																																																																																																																																																																						
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A1---0810-G2	1	LOCATION MAP AND SCOPE OF WORK	-	A1---0810-E30	2	ONE LINE DIAGRAM - EXISTING/DEMOLITION	-																																																																																																																																																																			
A1---0810-G3	2	DRAWING INDEX	-	A1---0810-E31	2	ONE LINE DIAGRAM - NEW WORK	-																																																																																																																																																																			
A1---0810-G4	1	GENERAL NOTES, SYMBOLS AND ABBREVIATIONS	-	A1---0810-E32	1	SITE PLANS - DEMOLITION & NEW WORK	-																																																																																																																																																																			
ELECTRICAL				A1---0810-E33	1	EQUIPMENT PLAN & ELEVATION - EXISTING/DEMOLITION	-																																																																																																																																																																			
A1---0810-E1	3	ELECTRICAL NOTES, SYMBOLS AND ABBREVIATIONS	-	A1---0810-E34	1	EQUIPMENT PLAN & ELEVATION - NEW WORK	-																																																																																																																																																																			
STRUCTURAL				A1---0810-E35	1	PHOTO DETAILS - EXISTING/DEMOLITION	-																																																																																																																																																																			
A1---0810-S1	1	STRUCTURAL NOTES, SYMBOLS AND ABBREVIATIONS	-	A1---0810-E36	1	THREE LINE DIAGRAM - DEMOLITION	-																																																																																																																																																																			
N202 & N202A OUTDOOR SUBSTATION (BASE BID)				A1---0810-E37	1	THREE LINE DIAGRAM - NEW WORK	-																																																																																																																																																																			
ELECTRICAL				A1---0810-E38	1	VCB088 BREAKER CONTROL DIAGRAM - DEMOLITION & NEW WORK	-																																																																																																																																																																			
A1---0810-E2	1	ONE LINE DIAGRAM - EXISTING/DEMOLITION	-	A1---0810-E39	1	MANHOLE MH E18 DETAILS - EXISTING/DEMOLITION & NEW WORK	-																																																																																																																																																																			
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A1---0810-E4	1	SITE PLANS - DEMOLITION & NEW WORK	-	A1---0810-E41		NOT USED	-																																																																																																																																																																			
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STRUCTURAL				A1---0810-E48	1	EQUIPMENT PLAN AND ELEVATION - EXISTING/DEMOLITION	-																																																																																																																																																																			
A1---0810-S2	1	FOUNDATION PLAN	-	A1---0810-E49	1	EQUIPMENT PLAN AND ELEVATION - NEW WORK	-																																																																																																																																																																			
N203 & N204 OUTDOOR SUBSTATION UPGRADE (BASE BID)				A1---0810-E50	1	PHOTO DETAILS - EXISTING/DEMOLITION	-																																																																																																																																																																			
ELECTRICAL				A1---0810-E51	2	NOT USED	-																																																																																																																																																																			
A1---0810-E15	1	ONE LINE DIAGRAM - EXISTING/DEMOLITION	-	A1---0810-E52	1	NOT USED	-																																																																																																																																																																			
A1---0810-E16	1	ONE LINE DIAGRAM - NEW WORK	-	A1---0810-E53	1	NOT USED	-																																																																																																																																																																			
A1---0810-E17	1	SITE PLANS - DEMOLITION & NEW WORK	-	A1---0810-E54	1	NOT USED	-																																																																																																																																																																			
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A1---0810-E19	1	EQUIPMENT PLAN - NEW WORK	-	A1---0810-S5	1	FOUNDATION PLAN	-																																																																																																																																																																			
A1---0810-E20	1	PHOTO DETAILS - EXISTING/DEMOLITION	-	<div style="text-align: center;"> <p>Approved for Construction Moffett Field Permit Board</p>  <p>Chief Building Official Permit No. 09Q038</p> </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>ZONE</td> <td>LETTER</td> <td>DESCRIPTION</td> <td>DRAWN</td> <td>DATE</td> <td>APPRVD</td> </tr> <tr> <td colspan="6" style="text-align: center;">REVISIONS</td> </tr> <tr> <td colspan="6" style="text-align: center;">  Ames Research Center Moffett Field, California </td> </tr> <tr> <td colspan="6" style="text-align: center;">RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII GENERAL</td> </tr> <tr> <td colspan="6" style="text-align: center;">DRAWING INDEX</td> </tr> <tr> <td colspan="6"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>DRAWN P. ALDEN</td> <td>DATE 4/30/09</td> <td>DATE 4/30/09</td> <td colspan="3"></td> </tr> <tr> <td>DESIGNED N. 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FRANKEL</td> <td>DATE 5/25/09</td> <td>DATE</td> <td>SIZE D</td> <td>CAGE CODE 25307</td> <td>SCALE</td> </tr> </table> </td> </tr> <tr> <td>A1---0810-E21</td> <td>1</td> <td>THREE LINE DIAGRAM - DEMOLITION</td> <td>-</td> <td colspan="2">INDEX</td> <td>SHEET 1 OF 2</td> </tr> <tr> <td>A1---0810-E22</td> <td>1</td> <td>THREE LINE DIAGRAM - NEW WORK</td> <td>-</td> <td colspan="2">FILE NAME:</td> <td>A1---0810-G003_1_R8.DWG 4-30-09</td> </tr> <tr> <td>A1---0810-E23</td> <td>1</td> <td>VCB490 BREAKER CONTROL DIAGRAMS - DEMOLITION & NEW WORK</td> <td>-</td> <td colspan="2"></td> <td></td> </tr> <tr> <td>A1---0810-E24</td> <td>1</td> <td>MHE36 DETAILS - EXISTING/DEMOLITION & NEW WORK</td> <td>-</td> <td colspan="2"></td> <td></td> </tr> <tr> <td>A1---0810-E25</td> <td>1</td> <td>NOT USED</td> <td>-</td> <td colspan="2"></td> <td></td> </tr> <tr> <td>A1---0810-E26</td> <td>1</td> <td>NOT USED</td> <td>-</td> <td colspan="2"></td> <td></td> </tr> <tr> <td>A1---0810-E27</td> <td>1</td> <td>NOT USED</td> <td>-</td> <td colspan="2"></td> <td></td> </tr> <tr> <td>A1---0810-E28</td> <td>1</td> <td>NOT USED</td> <td>-</td> <td colspan="2"></td> <td></td> </tr> <tr> <td>A1---0810-E29</td> <td>1</td> <td>NOT USED</td> <td>-</td> <td colspan="2"></td> <td></td> </tr> <tr> <td colspan="4">STRUCTURAL</td> <td colspan="4"></td> </tr> <tr> <td>A1---0810-S3</td> <td>1</td> <td>FOUNDATION PLAN - DEMOLITION AND NEW WORK</td> <td>-</td> <td colspan="4"></td> </tr> </table>				ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD	REVISIONS						 Ames Research Center Moffett Field, California						RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII GENERAL						DRAWING INDEX						<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>DRAWN P. 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A1---0810-E21	1	THREE LINE DIAGRAM - DEMOLITION	-	INDEX		SHEET 1 OF 2																																																																																																																																																																				
A1---0810-E22	1	THREE LINE DIAGRAM - NEW WORK	-	FILE NAME:		A1---0810-G003_1_R8.DWG 4-30-09																																																																																																																																																																				
A1---0810-E23	1	VCB490 BREAKER CONTROL DIAGRAMS - DEMOLITION & NEW WORK	-																																																																																																																																																																							
A1---0810-E24	1	MHE36 DETAILS - EXISTING/DEMOLITION & NEW WORK	-																																																																																																																																																																							
A1---0810-E25	1	NOT USED	-																																																																																																																																																																							
A1---0810-E26	1	NOT USED	-																																																																																																																																																																							
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A1---0810-S3	1	FOUNDATION PLAN - DEMOLITION AND NEW WORK	-																																																																																																																																																																							

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DWG NO. A1---0810-G3

SHT 2 REV -

DRAWING INDEX ~ REDS PHASE-VIII

NASA NO.	SHEETS	DESCRIPTION	REV	NASA NO.	SHEETS	DESCRIPTION	REV
N221B OUTDOOR SUBSTATION UPGRADE (ADDITIVE #2)				TYPICAL DETAILS			
ELECTRICAL				ELECTRICAL DETAILS (BASE BID AND ADDITIVES 1 & 2)			
A1---0810-E55	1	ONE LINE DIAGRAM - EXISTING/DEMOLITION	-	A1---0810-E80	1	TYPICAL SIGNAGE AND EQUIPMENT NAMEPLATE SCHEDULE	-
A1---0810-E56	1	ONE LINE DIAGRAM - NEW WORK	-	A1---0810-E81	1	TYPICAL RELAY UNITS PANEL MOUNTING DETAILS	-
A1---0810-E57	1	SITE PLANS - EXISTING/DEMOLITION & NEW WORK	-	A1---0810-E82	1	TYPICAL 50/51 RELAY WIRING AND INTERCONNECTION DIAGRAM	-
A1---0810-E58	1	EQUIPMENT PLAN AND ELEVATION - DEMOLITION	-	A1---0810-E83	1	TYPICAL GROUNDING DETAILS	-
A1---0810-E59	1	EQUIPMENT PLAN AND ELEVATION - NEW WORK	-	A1---0810-E84	1	TYPICAL MISCELLANEOUS INSTALLATION DETAILS	-
A1---0810-E60	1	PHOTO DETAILS - EXISTING/DEMOLITION	-	A1---0810-E85	1	TYPICAL MISCELLANEOUS INSTALLATION DETAILS	-
A1---0810-E61	1	THREE LINE DIAGRAM - DEMOLITION	-	A1---0810-E86	1	TYPICAL CABLE ROUTING DETAILS	-
A1---0810-E62	1	THREE LINE DIAGRAM - NEW WORK	-	STRUCTURAL DETAILS (BASE BID AND ADDITIVES 1 & 2)			
A1---0810-E63	1	VCB590 BREAKER CONTROL DIAGRAM - DEMOLITION & NEW WORK	-	A1---0810-S7	1	SECTIONS	-
A1---0810-E64	2	VAULT # 2 DETAILS - EXISTING/DEMOLITION & NEW WORK	-	A1---0810-S8	1	SECTIONS	-
A1---0810-E65	1	MHE160 DETAILS - EXISTING/DEMOLITION & NEW WORK	-	A1---0810-S9	1	DETAILS	-
A1---0810-E66	1	NOT USED	-	A1---0810-S10	1	DETAILS	-
A1---0810-E67	1	NOT USED	-				
A1---0810-E68	1	NOT USED	-				
A1---0810-E69	1	NOT USED	-				
STRUCTURAL							
A1---0810-S6	1	FOUNDATION PLAN	-				
N226 INDOOR/OUTDOOR SUBSTATION UPGRADE (BASE BID)							
ELECTRICAL							
A1---0810-E70	1	ONE LINE DIAGRAM - EXISTING/DEMOLITION	-				
A1---0810-E71	1	ONE LINE DIAGRAM - NEW WORK	-				
A1---0810-E72	1	SITE PLANS - EXISTING/DEMOLITION & NEW WORK	-				
A1---0810-E73	1	EQUIPMENT PLAN & ELEVATION - EXISTING/DEMOLITION	-				
A1---0810-E74	1	EQUIPMENT PLAN & ELEVATION - NEW WORK	-				
A1---0810-E75	1	MISCELLANEOUS PHOTO DETAILS - EXISTING/DEMOLITION	-				
A1---0810-E76	1	THREE LINE DIAGRAM - DEMOLITION	-				
A1---0810-E77	1	THREE LINE DIAGRAM - NEW WORK	-				
A1---0810-E78	1	VCB077 BREAKER CONTROL DIAGRAMS - DEMOLITION & NEW WORK	-				
A1---0810-E79	1	NOT USED	-				

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
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REVISIONS

DRAWN	PJA	DATE	4/20/09
DESIGNED	N.NIZAMOVA	DATE	4/30/09
CHECKED	J.MCCUSKER	DATE	4/30/09
PROJ.MGR	N.NIZAMOVA	DATE	4/30/09
REQUESTER	N.HSU	DATE	4/30/09
RQA		DATE	

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII
GENERAL

DRAWING INDEX

SUPERVISOR	S.FRANKEL	DATE	5-19-09	SIZE	D	CAGE CODE	25307	INDEX	A1---0810-G3	REV	-
SCALE:				SHEET		2		OF		2	

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GENERAL NOTES

- 1. THIS PROJECT HAS BEEN DESIGNED COMPLETELY IN ENGLISH UNITS. ALL INSPECTIONS WILL TAKE PLACE IN ENGLISH DIMENSIONS. SHOP DRAWINGS MUST BE SUBMITTED WITH ENGLISH DIMENSIONS UNLESS OTHERWISE DIRECTED BY THE CONTRACTING OFFICER (COTR).

DEMOLITION NOTES

- 1. THE CONTRACTOR SHALL ATTEND A PRE-DEMOLITION JOB SITE MEETING CONDUCTED BY THE CONTRACTING OFFICER PRIOR TO DEMOLITION TO SCHEDULE THE WORK WITH THE USER SO AS NOT TO INTERFERE WITH USER'S NORMAL BUSINESS OPERATIONS.

CODES AND STANDARDS

ALL WORK SHALL BE IN ACCORDANCE WITH THE CODES LISTED IN APD 8829.1 AVAILABLE ON-LINE AT: "HTTP://SERVER-MPO.ARC.NASA.GOV/SERVICES/COMSDOCS/CENTERS/ARC/DIRS/APD/8829.1.HTML" INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

HEALTH, SAFETY AND ENVIRONMENTAL REQUIREMENTS

- 1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF CAL-OSHA, FED-OSHA, CAL-EPA, FED-EPA, SANTA CLARA COUNTY, THE BAAQMD (BAY AREA AIR QUALITY MANAGEMENT DISTRICT), THE RWQCB (REGIONAL WATER QUALITY CONTROL BOARD) AND THE SWPPP (STORM WATER POLLUTION PREVENTION PLAN). IN ADDITION, ALL WORK ON AMES RESEARCH CENTER PROPERTY SHALL COMPLY WITH THE PROVISIONS OF THE AMES HEALTH AND SAFETY MANUAL (APR 1700.1) AND THE AMES ENVIRONMENTAL MANAGEMENT HANDBOOK (APR 8800.3).

GENERAL SYMBOLS

SYMBOL DESCRIPTION
EXISTING TO BE TO REMAIN
NEW
EXISTING TO BE DEMOLISHED
KEY NOTE NUMBER
POINT OF DISCONNECTION
POINT OF CHANGE
EQUIPMENT ID NO.
DETAIL OR NOTE REFERENCE
DETAIL REFERENCE
SECTION
PHOTOGRAPHIC VIEWPOINT OR ELEVATION

QUALITY CONTROL

THE CONSTRUCTION INSPECTIONS LISTED ARE IN ADDITION TO THE INSPECTIONS REQUIRED BY CBC 2007 APPENDIX CHAPTER 1 SECTION 109. SPECIALLY INSPECTED WORK THAT IS INSTALLED OR COVERED WITHOUT THE APPROVAL OF THE BUILDING OFFICIAL AND THE SPECIAL INSPECTOR, IS SUBJECT TO REMOVAL OR EXPOSURE.

Approved for Construction
Moffett Field Permit Board
Chief Building Official
Permit No. 09Q038

Table with columns: ZONE, LETTER, DESCRIPTION, DRAWN, DATE, APPRVD

Table with columns: DRAWN, DESIGNED, CHECKED, PROMGR, REQUESTER, R&QA, SAFETY, SUPERVISOR

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
GENERAL

GENERAL NOTES, SYMBOLS AND ABBREVIATIONS

Table with columns: SIZE, CAGE CODE, SCALE, AS SHOWN, INDEX, SHEET OF

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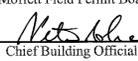
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ELECTRICAL NOTES

ELECTRICAL NOTES (CONT)

1. THE COMPLETE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE CALIFORNIA ELECTRICAL CODE, 2007, NATIONAL ELECTRICAL CODE AND NATIONAL ELECTRICAL SAFETY CODE (LATEST EDITION).
2. CONDUCTOR SIZES ARE AWG & KCMIL, U.O.N.
3. ALL ELECTRICAL ITEMS SHALL BE NEW U.O.N.
4. DARK OR HEAVY LINES INDICATE NEW WORK. LIGHT LINES DENOTE EXISTING CONDITIONS.
5. EXISTING CONDITIONS: THESE DRAWINGS SHOW EXISTING EQUIPMENT, MATERIAL, WIRING, ETC. BASED UPON THE BEST AVAILABLE INFORMATION. CONTRACTOR SHALL CONFIRM EXISTING CONDITIONS, WIRING, LOCATION OF EQUIPMENT, DIMENSIONS, ETC PRIOR TO STARTING ANY WORK OR ORDERING ANY MATERIAL. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING EXISTING UNDERGROUND UTILITIES, CORRECTING DISCREPANCIES AND PROVIDING A COMPLETE PROPER OPERATING SYSTEM.
6. WHEN USED IN THESE DRAWINGS AND THE ACCOMPANYING SPECIFICATIONS THE FOLLOWING DEFINITIONS APPLY:
FURNISH: CONTRACTOR TO SUPPLY AND DELIVER COMPLETE.
INSTALL: CONTRACTOR TO PLACE, SECURE AND CONNECT AND TEST AS REQUIRED TO MAKE FULLY OPERATIONAL.
PROVIDE: CONTRACTOR TO FURNISH AND INSTALL AS DEFINED ABOVE.
7. EXISTING EQUIPMENT AND/OR ELECTRICAL WIRING WHICH IS TO REMAIN, BUT HAS TO BE REMOVED TO FACILITATE THE INSTALLATION OF THE NEW EQUIPMENT SHALL BE RESTORED TO ITS ORIGINAL OPERATING CONDITION.
8. INSTALLATION OF ELECTRICAL EQUIPMENT, RACEWAYS, STRUCTURES AND FOUNDATIONS SHALL BE DESIGNED BASED UPON CRITERIA OF SEISMIC AND WIND OF CBC (CALIFORNIA BUILDING CODE) 2007 EDITION, FOR SEISMIC ZONE 4, WIND SPEED 120 MPH, NEAR SOURCE FACTOR $N_s=1.2$. STRUCTURAL CALCULATIONS AND DRAWINGS SHALL BE STAMPED BY A PROFESSIONAL CIVIL ENGINEER LICENSED BY THE STATE OF CALIFORNIA AND SHALL BE SUBMITTED TO 'COTR' PRIOR TO FABRICATION/CONSTRUCTION.
9. EXISTING CONDUCTORS REMOVED FROM SERVICE SHALL NOT BE USED FOR NEW WORK UNDER THIS CONTRACT, UNLESS OTHERWISE NOTED.
10. EXISTING CONDUIT RUNS REMAINING IN PLACE MAY BE UTILIZED FOR THE NEW WORK, PROVIDED THAT THE CONDUIT IS OF ADEQUATE SIZE PER NATIONAL ELECTRICAL CODE FOR THE NUMBER AND SIZE OF CONDUCTORS BEING INSTALLED. CONDUCTORS SHALL BE OF THE SAME VOLTAGE. CONTRACTOR SHALL PULL A HARD MANDREL THROUGH CONDUITS AND VERIFY THAT CABLES CAN BE PULLED SAFELY WITHOUT DAMAGE TO CABLE JACKET.
11. PROVIDE ENGRAVED NAMEPLATES ON ALL NEW AND AFFECTED EXISTING EQUIPMENT AND DEVICES INCLUDING PULL BOXES. NAMEPLATES SHALL BE SCREWED ON PHENOLIC TYPE WITH WHITE LETTERS ON BLACK BACKGROUND. THE NAMEPLATE SHALL BE OF APPROPRIATE SIZE WITH LETTER HEIGHTS PER SPECIFICATIONS SECTION 16000, DRAWING E80, AND SUBJECT TO APPROVAL BY THE CONTRACTING OFFICER.
12. ALL POWER SHUTDOWN SHALL BE SCHEDULED ON WEEKENDS OR HOLIDAYS OR WITH PRIOR WRITTEN APPROVAL BY THE CONTRACTING OFFICER.
13. THE CONTRACTOR SHALL REQUEST ALL BUILDING POWER OUTAGES AT LEAST TWENTY ONE (21) DAYS IN ADVANCE OF THE OUTAGES.
14. SUBSTATION N225B IS VITAL TO THE OPERATION OF NASA RESEARCH CENTER. SUBSTATION SHUTDOWN CAN ONLY BE ACCOMPLISHED ON WEEKENDS (5:00 PM FRIDAY TO 5:00 PM SUNDAY) OR ON HOLIDAYS (6:00 AM TO 5:00 PM ONLY). ALL SCHEDULED SHUTDOWNS SHALL BE REQUESTED AT LEAST TWENTY ONE (21) CALENDAR DAYS IN ADVANCE. THE CONTRACTOR SHALL TAKE THESE CONSTRAINTS INTO CONSIDERATION IN PREPARING AND SCHEDULING OF ALL CONSTRUCTION ACTIVITIES FOR THIS CONTRACT.
15. THE CONTRACTOR SHALL SUBMIT AN UTILITY OUTAGE REQUEST AND EXPECTED LENGTH OF THE POWER INTERRUPTION TO THE CONTRACTING OFFICER FOR APPROVAL IN NO LESS THAN TWENTY ONE (21) CALENDAR DAYS PRIOR TO A REQUIRED UTILITY OUTAGE (ELECTRICAL, TELEPHONE). NO OUTAGE SHALL BE ACCOMPLISHED PRIOR TO THE RECEIPT OF APPROVAL. NASA SHALL PERFORM ALL SWITCHING 6900V AND ABOVE. THE CONTRACTOR SHALL PERFORM ALL SWITCHING BELOW 6900V. THE CONTRACTOR/NASA-AMES SHALL LOCK OUT AND RED TAG THE APPROPRIATE CIRCUIT BREAKER, SWITCH, ETC. THE RED TAG SHALL LIST THE CIRCUIT, THE TIME OF OUTAGE, THE INDIVIDUAL AND FIRM EFFECTING THE OUTAGE, THE EXPECTED TIME THE OUTAGE WILL BE TERMINATED, AND PHONE NUMBER TO CONTACT REGARDING THE OUTAGE. THE TAG SHALL ALSO WARN PEOPLE NOT TO RE-ENERGIZE THE CIRCUIT SYSTEM BECAUSE THE POTENTIAL DANGER TO PERSONNEL/EQUIPMENT. TIMES FOR THESE SHUTDOWNS ARE FROM 6:00 AM, SATURDAY MORNING TO 5:00 PM, SUNDAY AFTERNOON; AND FROM 6:00 AM TO 5:00 PM ON HOLIDAYS.
16. POWER DISRUPTION OVER 48 HOURS MAY CAUSE THE LOSE OF THE FIRE ALARM SYSTEM SERVICE. CONTRACTOR SHALL NOTIFY THE FIRE DEPARTMENT OF THE LOSS OF ALARMS IF THIS OCCURS.
17. CONTRACTOR SHALL STRICTLY FOLLOW ALL STANDARD SAFETY PRACTICES, PRECAUTIONS, AND REQUIREMENTS OF NASA-AMES RESEARCH CENTER FOR ALL WORK INSIDE AN ENCLOSED AND ENERGIZED 115kV SUBSTATION. REFER TO AMES HEALTH & SAFETY MANUAL APG 1700.1.
18. ALL WIRES SHALL BE TAGGED FOR IDENTIFICATION BEFORE DISCONNECTION.
19. REPLACEMENT OF OTHER UNDERGROUND MEDIUM VOLTAGE DISTRIBUTION LINES, MANHOLES AND VAULTS, BY ANOTHER CONTRACTOR, MAY BE SCHEDULED DURING THE CONSTRUCTION PERIOD OF THIS CONTRACT. ALL WORK IN THIS CONTRACT SHALL BE COORDINATED WITH THE CONTRACTING OFFICER TO AVOID CONFLICT OF ACTIVITIES WITH OTHER CONTRACTS IN PROGRESS.
20. REPAIR DAMAGES TO GALVANIZED STEEL MEMBERS USING ASTM A780 ZINC RICH PAINT. PAINT ALL NEW HOLES DRILLED ON EXISTING GALVANIZED STEEL MEMBERS. DO NOT HEAT SURFACES TO WHICH REPAIR PAINT HAS BEEN APPLIED.
21. FIRE PROOFING TAPE SHALL BE WRAPPED AROUND EACH CABLE BEING WORKED ON IN THE MANHOLE. STARTING AND FINISHING OF FIRE PROOFING SHALL BE DONE WITH APPROVED FIBERGLASS TAPE.
22. ALL CABLES SHALL BE SUPPORTED PROPERLY AND ROUTED NEATLY ALONG THE MANHOLE WALL.
23. ALL NEW SPARE CONDUITS SHALL BE PROVIDED WITH A 1/4" NYLON PULL WIRE PRIOR TO CAPPING. PROVIDE IDENTIFICATION LABELS AND TAG SPARE CONDUITS INDICATING ORIGIN AND DESTINATION AT BOTH ENDS.
24. NEW CONDUITS SHALL BE SEALED AND FIRE PROOFED AT ENTRIES TO MANHOLES/VAULTS.
25. ALL MV FEEDER CABLES SHALL HAVE PHASE IDENTIFICATION AND FEEDER TAGS IN MANHOLES.
26. CABLE AND WIRE USED SHALL MEET THE FOLLOWING:
 FOR SIZES #1 AND SMALLER CABLES SHALL BE RATED FOR 60°C, MINIMUM.
 FOR SIZES #1/0 AND LARGER CABLES SHALL BE RATED FOR 75°C, MINIMUM.
27. ALL PENETRATIONS THROUGH FIRE RATED WALLS SHALL BE TOTALLY SEALED TO PREVENT THE SPREAD OF SMOKE, FIRE, TOXIC GASES, AND WATER THROUGH THE PENETRATION BEFORE, DURING AND AFTER A FIRE CONDITION. THE FIRE RATING OF THE SEALED PENETRATION SHALL BE AT LEAST THAT OF THE WALL INTO WHICH IT IS INSTALLED. THE SEAL SHALL PERMIT THE VIBRATION, EXPANSION AND/OR CONTRACTION OF THE CONDUIT PASSING THROUGH THE PENETRATION WITHOUT THE SEAL CRACKING OR CRUMBLING. CONFORM TO CEC, 2007.

28. PRIOR TO START OF WORK, CONTRACTOR SHALL SUBMIT A COMPREHENSIVE SAFETY PROGRAM TO THE CONTRACTING OFFICER FOR APPROVAL BY THE NASA SAFETY OFFICE. ALL SAFETY ITEMS WILL BE DISCUSSED AT THE PRE-CONSTRUCTION MEETING.
29. THE CONTRACTOR SHALL OBTAIN A VALID AIR QUALITY PERMIT FOR THE TEMPORARY POWER GENERATOR WHICH SHALL BE POSTED AT A VISIBLE LOCATION ON THE GENERATOR UNIT. ALL PERMIT CONDITIONS SHALL BE COMPLIED WITH AND RECORDS SHALL BE SENT TO THE NASA SAFETY OFFICE, CODE QE FOR COMPLIANCE DOCUMENTATION.
30. PROVIDE GROUND FAULT PROTECTION EQUIPMENT FOR EACH SERVICE, FEEDER AND BRANCH CIRCUIT BREAKER OR DISCONNECT RATED 1000A OR MORE ON SOLIDLY GROUND SYSTEM OF MORE THAN 150V TO GROUND (AT 480Y/277V) IN ACCORDANCE WITH CEC/NEC.
31. PROVIDE FIELD MARKINGS OF PROPER WARNING LABELS FOR ARC FLASH AND SHOCK HAZARD PROTECTION ON ALL SWITCHBOARDS, PANELBOARDS, INDUSTRIAL CONTROL PANELS AND MOTOR CONTROL CENTERS IN ACCORDANCE WITH CEC/NEC ARTICLE 110. WARNING LABELS SHALL CONFORM TO APPLICABLE PROVISIONS OF NFPA 70E AND ANSI Z535.4, AND SUBJECT TO APPROVAL BY THE CONTRACTING OFFICER.
32. PRIOR TO ENERGIZATION OF EQUIPMENT OR CIRCUITS, THE CONTRACTOR SHALL DEVELOP A TEST PROCEDURE AND SUBMIT IT TO THE CONTRACTING OFFICER FOR REVIEW AND APPROVAL. THE CONTRACTOR SHALL PERFORM A COMPLETE FUNCTIONAL TEST TO DEMONSTRATE TO THE CONTRACTING OFFICER THAT THE NEW INSTALLATION IS OPERATING AS INTENDED. ANY DEFECTS OR DEFICIENCIES IN THE MATERIALS OR INSTALLATION WORK SHALL BE CORRECTED IMMEDIATELY BY AND AT THE CONTRACTOR'S EXPENSE.
33. ALL PERSONNEL WORKING IN MANHOLES (MH) SHALL BE CERTIFIED IN ACCORDANCE WITH OSHA CONFINED SPACE REGULATION 29 CFR 1910.146 AND CAL OSHA CONFINED SPACE REGULATIONS CCR5156,5157,5158 AND 5159.
34. CERTIFICATION OF THE QUALIFICATIONS OF THE MEDIUM VOLTAGE (MV) CABLE SPLICER/TERMINATOR SHALL BE SUBMITTED TO THE CONTRACTING OFFICER. THE CERTIFICATION SHALL INCLUDE THE TRAINING AND EXPERIENCE OF THE INDIVIDUAL. THE CERTIFICATION SHALL INDICATE THAT THE INDIVIDUAL HAS HAD THREE OR MORE YEARS OF EXPERIENCE SPLICING AND TERMINATING MEDIUM VOLTAGE CABLES. ONCE A MV TERMINATION OR SPLICE HAS BEEN STARTED BY A WORKER, THE SAME PERSON SHALL COMPLETE THAT PARTICULAR SPLICE. EACH MV TERMINATION AND SPLICE SHALL BE STARTED AND COMPLETED IN ONE CONTINUOUS WORK PERIOD.
35. CONTRACTOR SHALL USE EXTREME CAUTION AND TAKE ALL NECESSARY SAFETY PRECAUTIONS WHEN WORKING IN THE MANHOLES. MULTIPLE SYSTEM VOLTAGES MAY EXIST IN THE MANHOLES AND CAN BE ANY COMBINATION OF THE FOLLOWING:
 13.8KV
 6.9KV
 480V
 208Y/120V
 480Y/277V
 COMM CIRCUITS
36. THE CONTRACTOR SHALL NOTIFY THE CONTRACTING OFFICER AT LEAST SEVEN (7) DAYS IN ADVANCE TO DEWATER EXISTING MANHOLES (MH).
37. WHEN WORKING IN MANHOLES, CONTRACTOR SHALL COMPLY WITH NOTE 14 & 15. CONTRACTOR SHALL ASSUME THAT ALL MANHOLES CONTAIN ASBESTOS OR LEAD MATERIALS. EXTREME CARE SHALL BE MADE WHEN REMOVING MATERIALS FROM MANHOLES.
38. THE CONTRACTOR SHALL PROVIDE CABLE RACK CHANNELS, ARMS AND INSULATORS TO SUPPORT NEW CABLES, SPLICES, AND DEADBREAK JUNCTIONS IF NECESSARY.
39. ALL NEW CONDUITS AND CONDUIT DUCT BANKS SHALL BE SLOPED DOWN IN THE DIRECTION OF THE EXISTING MANHOLES.

Approved for Construction
 Moffett Field Permit Board

 Chief Building Official
 Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
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REVISIONS

DRAWN	DATE
P.A.	4/20/09
DESIGNED	DATE
N.NIZAMOVA	4/30/09
CHECKED	DATE
J.MCCUSKER	4/30/09
PRGMGR	DATE
N.NIZAMOVA	4/30/09
REQUESTER	DATE
N.HSU	4/20/09
R&QA	DATE

 **Ames Research Center**
 Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM--PHASE VII

ELECTRICAL
**ELECTRICAL NOTES, SYMBOLS
 AND
 ABBREVIATIONS**

SUPERVISOR	DATE	SIZE	CAGE CODE	SCALE	INDEX	SHEET	1 OF	3
S.FRANKEL	5-5-09	D	25307	1" = 1'-0"	A1---0810-E1	1	OF	3

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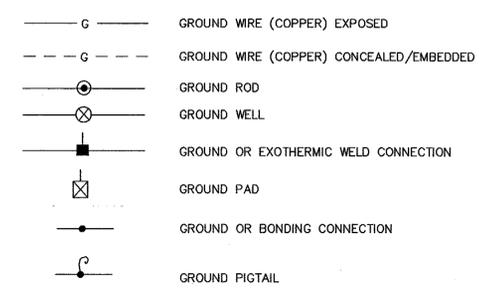
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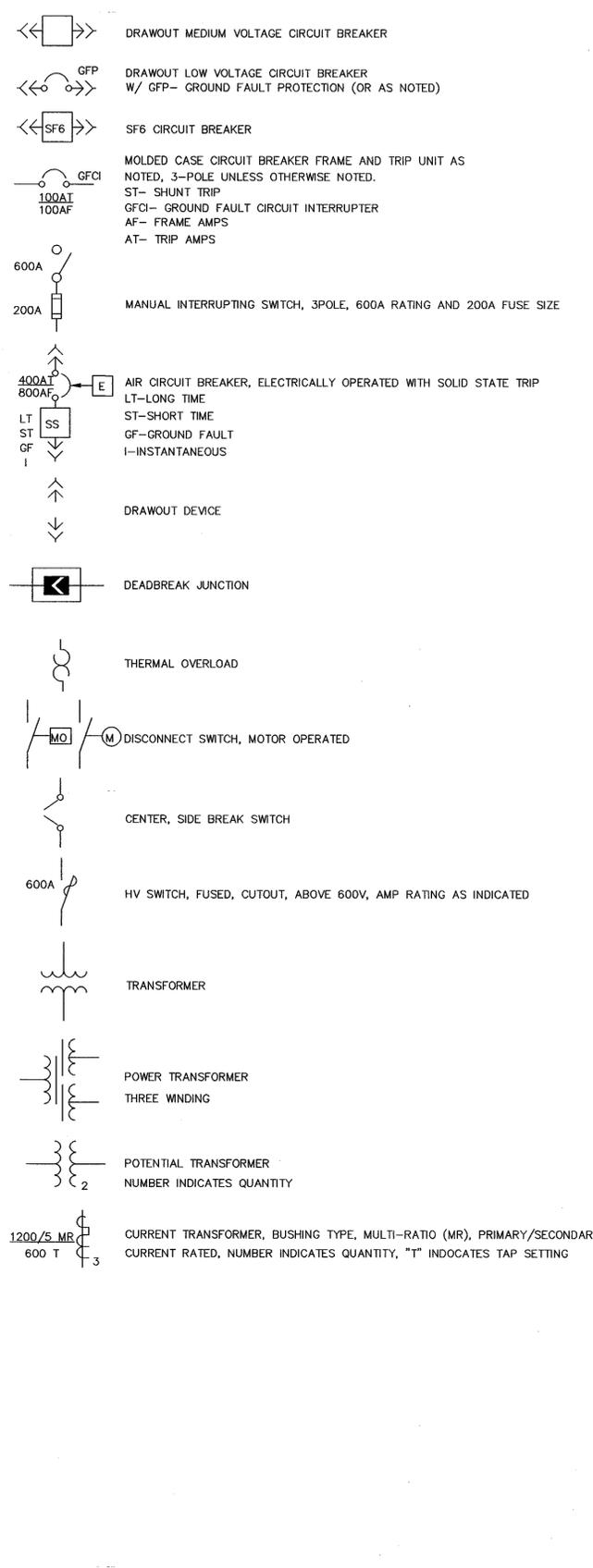
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8 GROUNDING SYMBOLS



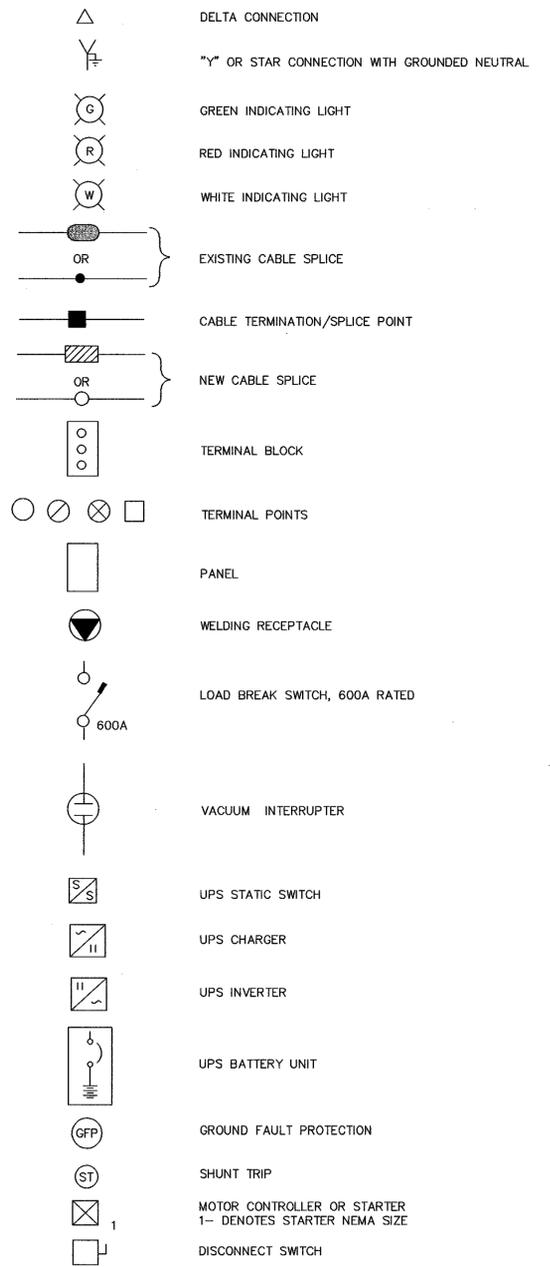
6 ONE LINE DIAGRAM SYMBOLS



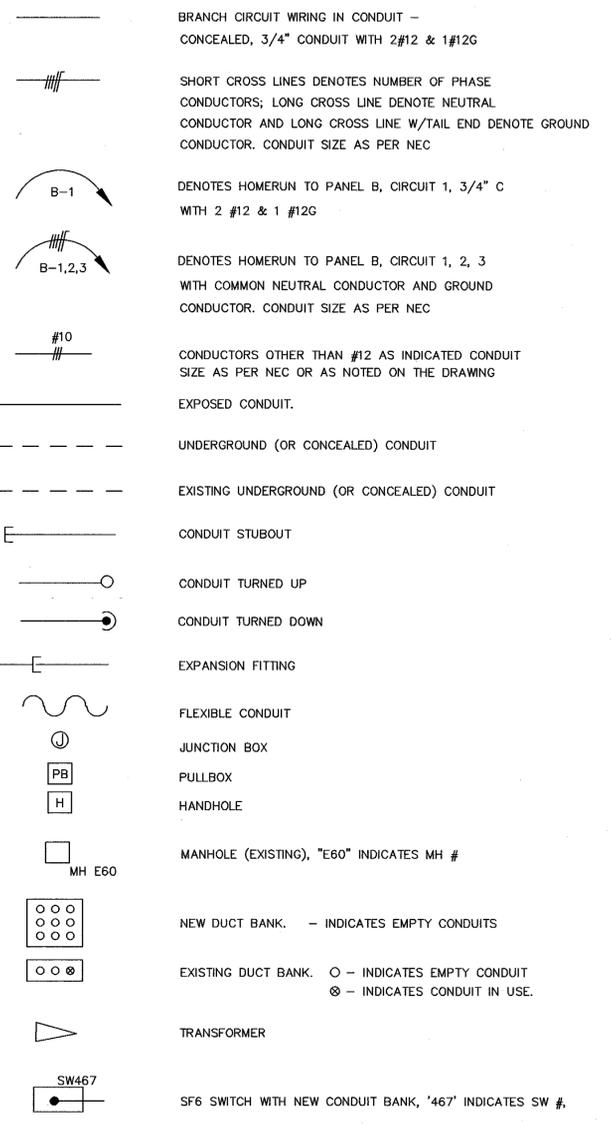
4 ELECTRICAL SYMBOLS



2 ELECTRICAL SYMBOLS (CONT'D)



7 POWER AND CONTROL SYMBOLS



Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DRAWN P. ALDEN DATE 4/20/09					
DESIGNED N. NIZAMOVA DATE 4/30/09					
CHECKED J. McCUSKER DATE 4/30/09					
PROJ MGR N. NIZAMOVA DATE 4/30/09					
REQUESTER N. HSU DATE 4/30/09					
R&QA DATE 4/30/09					
SAFETY DATE					
SUPERVISOR S. FRANKEL DATE 4/30/09					
SIZE	CAGE CODE	REV			
D	25307	A1---0810-E1			
SCALE:	INDEX	SHEET 2 OF 3			
FILE NAME: A1---0810-E001_2_RS.DWG 4-30-09					

DWG: \\fer19-n13\cadd\ARC\REDS\Phase VIII\500_CAD\60046720.000_1_PY08 - Consolidation folder\General\Sheet\A1---0810-E001_2_RS.dwg User: palden
 DATE: Apr 29, 2009 - 9:19:23 am Images: \\fer19-n13\cadd\ARC\REDS\Phase VIII\500_CAD\60046720.000_1_PY08 - Consolidation folder\General\Sheet\A1---0810-E001_2_RS.dwg
 Xrefs: \\fer19-n13\cadd\ARC\REDS\Phase VIII\500_CAD\60046720.000_1_PY08 - Consolidation folder\General\Sheet\A1---0810-E001_2_RS.dwg

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ABBREVIATIONS

ABBREVIATIONS (CON'T)

ABBREVIATIONS (CON'T)

ABBREVIATIONS (CON'T)

Table of abbreviations for column 8, including terms like AMPERE, ALL ALUMINUM, AIR AIR/FORCED AIR, etc.

Table of abbreviations for column 6, including terms like ELECTRICALLY OPERATED, CIRCUIT BREAKER, EACH, etc.

Table of abbreviations for column 4, including terms like METER, MILLI AMPERES, MICROPROCESSOR BASED ELECTRONIC RELAY, etc.

Table of abbreviations for column 2, including terms like SHORT CIRCUITING TERMINAL BLOCK, SUPPLY FAN, SULFUR-HEXAFLUORIDE, etc.

Vertical text on the left margin: DWG: \\f19-m3\cadd\ARC\VEDS\Phase VII\500_CAD\60046720.0001_FY08 - Consolidation folder_General\Sheet\A1---0810-E001_3_RB.dwg User: palden

Approved for Construction Moffett Field Permit Board Chief Building Official Permit No. 09Q038

Table with columns for ZONE, LETTER, DESCRIPTION, DRAWN, DATE, APPRVD, and a section for REVISIONS.

Ames Research Center logo and title: RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII ELECTRICAL NOTES, SYMBOLS AND ABBREVIATIONS

Table with columns for DRAWN, DATE, DESIGNED, DATE, CHECKED, DATE, etc., and a section for SAFETY.

Table with columns for SUPERVISOR, DATE, SCALE, CAGE CODE, INDEX, SHEET, OF, REV.

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DWG NO. A1---0810-S1 SHT REV

STRUCTURAL GENERAL NOTES

REINFORCEMENT STEEL

STRUCTURAL ABBREVIATIONS

FOUNDATIONS

- ALL WORK SHALL BE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL BUILDING CODES AND SAFETY ORDINANCES IN EFFECT AT THE TIME AND PLACE OF BUILDING.
- ANY CONFLICTS OR DISCREPANCIES BETWEEN THE DRAWINGS AND SITE CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER AND CORRECTED AS DIRECTED BY THE ENGINEER.
- CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS.
- NO PIPES OR SLEEVES SHALL PASS THROUGH STRUCTURAL MEMBERS WITHOUT APPROVAL OF CONTRACTING OFFICER UNLESS SHOWN ON STRUCTURAL DRAWINGS.
- CONCRETE SUB CONTRACTOR SHALL PROVIDE TEMPORARY SHORING AS REQUIRED TO INSURE VERTICAL & LATERAL STABILITY OF SOIL FOR FOUNDATION DURING CONSTRUCTION.

- REINFORCING BARS SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF ASTM A615, GRADE 60, DEFORMED BARS, EXCEPT #3 BAR GRADE 40.
- LAP SPLICE LENGTH SCHEDULE:

$$F_c = 4,000 \text{ PSI}$$

	BASIC LAP	TOP BAR LAP*
#4	28 IN.	37 IN.
#5	36 IN.	46 IN.
#6	43 IN.	56 IN.
#7	62 IN.	81 IN.

* TOP BAR LAPS OCCUR IN HORIZONTAL BARS OF FOOTINGS, SLABS AND WALLS WHERE MORE THAN ONE FOOT OF WET CONCRETE IS PLACED BELOW THE GIVEN REINFORCEMENT BAR.

- CONCRETE COVER:
 UNLESS OTHERWISE NOTED, CONCRETE COVERAGE OF REINFORCING BARS SHALL BE AS FOLLOWS:
 3" - ALL BARS WHERE CONCRETE IS DEPOSITED DIRECTLY AGAINST EARTH.
 2" - FOR #6 AND LARGER BARS WHERE CONCRETE IS EXPOSED TO EARTH AND/OR WEATHER BUT DEPOSITED AGAINST FORMS.
 1-1/2" - FOR #5 AND SMALLER BARS FOR SLABS, WALLS, BEAMS, COLUMNS AND EXTERIOR SURFACES EXPOSED TO EARTH OR WEATHER BUT DEPOSITED AGAINST FORMS.
- ALL REINFORCING STEEL AND EMBEDMENTS TO BE HELD SECURELY IN PLACE PRIOR TO PLACING CONCRETE. PROVIDE SUFFICIENT SUPPORTS TO ALLOW WALKING ON REINFORCEMENT. NO BRICK OR POROUS MATERIAL SHALL BE USED TO SUPPORT REINFORCING.

CL	CENTER LINE	MAX	MAXIMUM
A.B.	ANCHOR BOLT	MIN	MINIMUM
B.PL	BASE PLATE	(N)	NEW
BOT	BOTTOM	N.S.	NEAR SIDE
B.O.S	BOTTOM OF STEEL	N.T.S.	NOT TO SCALE
CLR	CLEAR	O.C.	ON CENTER
COL	COLUMN	OEM	ORIGINAL EQUIPMENT
CONT	CONTINUOUS	OPNG	MANUFACTURER OPENING
COTR	CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE	OPP	OPPOSITE
DET	DETAIL	PL	PLATE
DWL	DOWEL	PLCS.	PLACES
DWG	DRAWING	PS	PIPE SUPPORT
(E)	EXISTING	REINF	REINFORCING
EA	EACH	REQ'D	REQUIRED
E.F.	EACH FACE	SIM	SIMILAR
EMBED	EMBEDMENT	SPEC	SPECIFICATION
EQ	EQUAL	SPC	SPACING
E.W.	EACH WAY	STL	STEEL
F.S.	FAR SIDE	SYMM	SYMMETRICAL
F.F.	FINISH FLOOR	T&B	TOP AND BOTTOM
FTG	FOOTING	TBM	TEMPORARY BENCH MARK
GA	GAUGE	THK	THICK
GALV	GALVANIZED	T.O.	TOP OF
H.R.	HAND RAIL	T.O.F	TOP OF FOOTING
HORIZ	HORIZONTAL	T.O.S	TOP OF STEEL
HT	HEIGHT	T.O.C	TOP OF CONCRETE
LLH	LONG LEG HORIZONTAL	TYP	TYPICAL
LLV	LONG LEG VERTICAL	UNO	UNLESS NOTED OTHERWISE
		VERT	VERTICAL
		V.I.F.	VERIFY IN FIELD
		W.W.F.	WELDED WIRE FABRIC
		W.P.	WORK POINT

- UNDERLYING BASE OF NATIVE SOIL SHALL BE COMPACTED TO AT LEAST 90 PERCENT OF THE MAXIMUM DRY DENSITY.
- NO CONCRETE SHALL BE POURED IN ANY FOUNDATION UNTIL EXCAVATION HAS BEEN INSPECTED AND APPROVED BY COTR.
- FOUNDATION DESIGN IS BASED ON CALIFORNIA BUILDING CODE 2007, CHAPTER 18 TABLE 1804.2, TYPE 4.

DESIGN CRITERIA

STRUCTURAL STEEL

QUALITY CONTROL

CONCRETE

- APPLICABLE CODE 2007 CALIFORNIA BUILDING CODE, ASCE 7-05
- SEISMIC DESIGN NON-STRUCTURAL COMPONENTS.

$$F_p = \frac{0.4 a_p S_{DS} W_p}{\left(\frac{R_p}{I_p}\right)} \left(1 + 2 \frac{Z}{h}\right)$$

W_p = WEIGHT
 S_{DS} = 1
 a_p = 1
 I_p = 1
 R_p = 2.5
 Z = 0
 h = 12.0'
 F_{min} = 0.3 S_{DS} I_p W_p

- WIND DESIGN PER CBC SECTION 1609 OR ASCE 7 CHAPTER 6

F_w = q_z G C_f
 q_z = 0.00256 K_z K_{zt} K_d V²
 G = 0.85
 C_f = 1.58
 K_z = 0.85
 K_{zt} = 1
 K_d = 0.85
 I = 1
 EXPOSURE C
 V = 85 mph
 OCCUPANCY CATEGORY II

- FABRICATION AND CONSTRUCTION SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION, MANUAL OF STEEL CONSTRUCTION. ALLOWABLE STRESS DESIGN, SPECIFICATIONS AND CODES, 13TH EDITION.
- STRUCTURAL STEEL SHAPES, EXCEPT W-SHAPES, BARS AND ROD SHALL CONFORM TO ASTM A36.
- ALL STEEL PIPES SHALL BE STANDARD PIPE, SCHEDULE 40 (UNLESS INDICATED). CONFORMING TO ASTM A53, GRADE B F_y = 35 KSI
- BOLT HOLES IN STEEL SHALL BE 1/16" LARGER THAN BOLTS, UNLESS OTHERWISE NOTED ON PLANS. ALL BOLT HOLES TO BE DRILLED OR PUNCHED. BURNING OF HOLES SHALL NOT BE PERMITTED.
- ALL SHOP AND FIELD WELDING PER AWS, D1.1, STRUCTURAL WELDING CODE. WELDING ELECTRODE - E70XX, OR EQUIVALENT, SHALL BE USED AT ALL STRUCTURAL STEEL CONNECTIONS.
- DEFECTIVE WELDS SHALL BE GROUND OUT, REPAIRED, AND RE-TESTED AT CONTRACTORS EXPENSE.
- ALL STEEL EXPOSED TO WEATHER SHALL BE HOT-DIPPED GALVANIZED.
- ANY VENT HOLES OR LIFTING HOLES DUE TO GALVANIZING, SHALL BE REPAIRED (FILLED OUT) AFTER GALVANIZING.
- FURNISH COPIES OF MILL TEST REPORTS OF ALL STEEL MATERIALS TO THE GOVERNMENT SHOWING CONFORMANCE WITH SPECIFIED ASTM DESIGNATIONS PRIOR TO FABRICATION OF ANY WORK. CERTIFIED LOTS SHALL BE SO IDENTIFIED.

- INSPECTIONS AND TESTING SHALL COMPLY WITH SPECIFICATIONS.
- ALL INSPECTIONS INCLUDING SPECIAL INSPECTIONS AND CONTINUOUS INSPECTION SHALL BE DONE BY A QUALIFIED TESTING AGENCY AND QUALIFIED INSPECTORS AT THE EXPENSE OF THE CONTRACTOR. GOVERNMENT SHALL BE NOTIFIED IN ADVANCE TO WITNESS ALL THE TESTS. ALL TEST RESULTS DOCUMENTATIONS SHALL BE SUBMITTED TO THE GOVERNMENT.
- SPECIAL INSPECTION SHALL COMPLY WITH 2007 CBC, CHAPTER 17. SPECIAL INSPECTION SHALL BE PROVIDED FOR THE FOLLOWING USE:
 A) WELDING - WELDING SHALL BE DONE IN AN GOVERNMENT APPROVED SHOP. APPROVED FABRICATORS SHALL CONFORM TO CBC 1701. ALL FIELD WELDING SHALL HAVE CONTINUOUS INSPECTION.
 B) EPOXY TYPE ANCHOR BOLTS.
 C) REINFORCING STEEL PLACEMENT.
 D) ALL CONCRETE WORK.

- CONCRETE SHALL DEVELOP THE FOLLOWING MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS (MINIMUM F_c) WHEN TESTED IN ACCORDANCE WITH ASTM C39.
- PORTLAND CEMENT SHALL CONFORM TO ASTM C-150 TYPE II LOW ALKALI.
- PRIOR TO PLACING CONCRETE, THE CONTRACTOR SHALL ENSURE THAT ALL EMBEDMENTS, INCLUDING ANCHOR BOLTS, ARE PROPERLY LOCATED AND SECURELY TIED IN PLACE.
- DIMENSIONAL TOLERANCE FOR ALL CONCRETE WORK SHALL BE WITHIN ±1/8" OF DIMENSION SHOWN ON DRAWINGS. TOP OF FOOTING ELEVATIONS SHALL BE WITHIN ±1/16" OF ELEVATIONS SHOWN ON DRAWINGS. U.O.N.

Approved for Construction
 Moffett Field Permit Board

 Chief Building Official
 Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	PVA	DATE	4/30/09
DESIGNED	A.FIROUZI	DATE	4/30/09
CHECKED	M.CUS	DATE	4-30-09
PREPARED	N.NIZAMOVA	DATE	4-30-09
REQUESTER	N.HSU	DATE	4/30/09
R&QA		DATE	
SAFETY		DATE	
SUPERVISOR	S.FRANKEL	DATE	5-5-09

 **Ames Research Center**
 Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
 STRUCTURAL

**STRUCTURAL NOTES, SYMBOLS,
 AND
 ABBREVIATIONS**

SIZE	D	CAGE CODE	25307	REV	
SCALE	AS NOTED	INDEX		SHEET	OF

FILE NAME:
 A1---0810-S001.DWG 4-30-09

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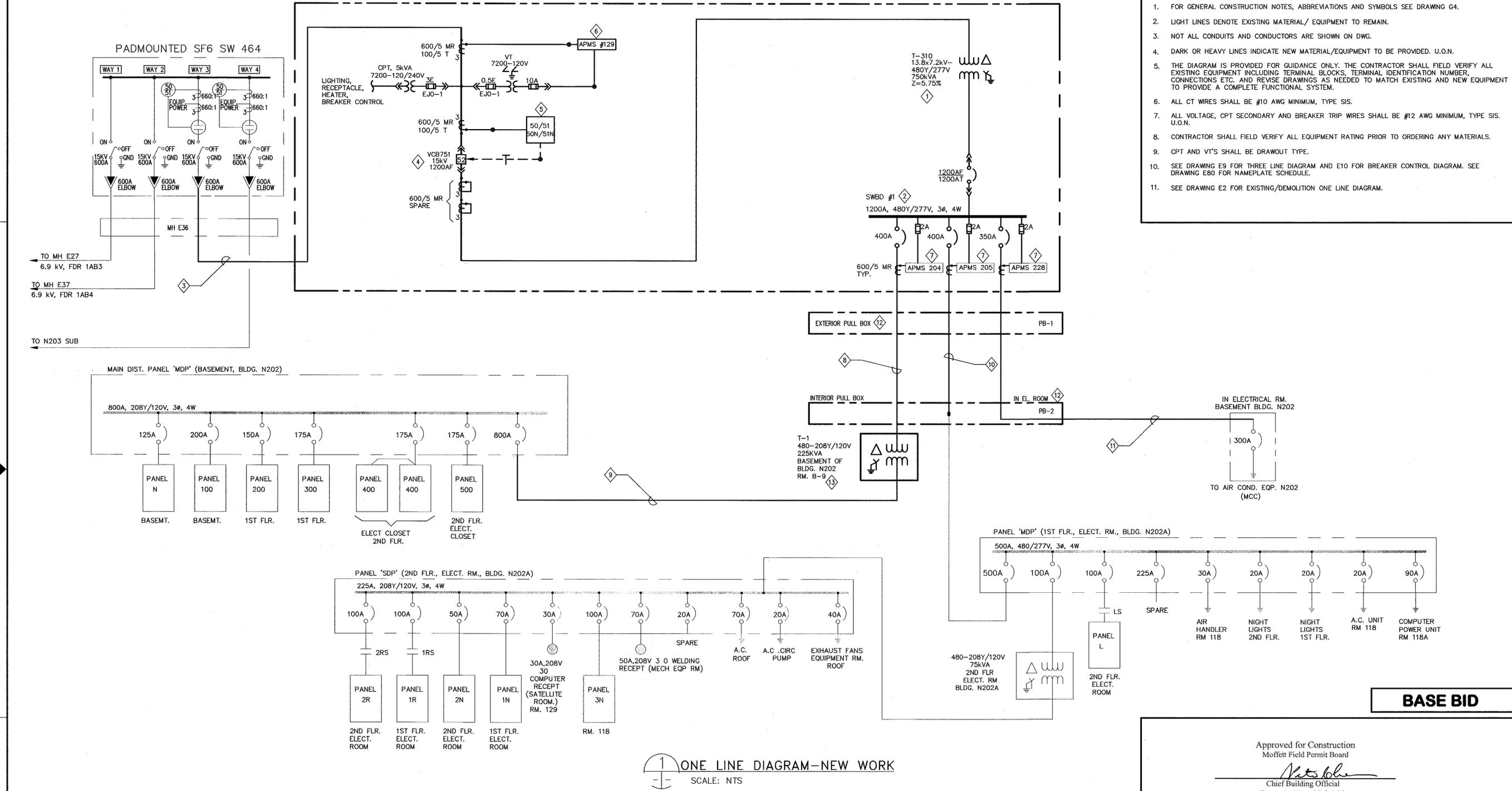
DWG: \\f19-n3\cadd\ARC\REDS\REDS Phase VII\500_CAD\60046720.0001_FY08 - Consolidation folder\General\Sheet\A1---0810-S001_1_RB.dwg User: palden
 DATE: Apr 29, 2009 - 9:19:30 am Images:
 Xrefs: \\f19-n3\cadd\ARC\REDS\REDS Phase VII\500_CAD\60046720.0001_FY08 - Consolidation folder\General\Sheet\REDSR1B01.dwg

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SHEET NOTES

- FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4.
- LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON DWG.
- DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- THE DIAGRAM IS PROVIDED FOR GUIDANCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT INCLUDING TERMINAL BLOCKS, TERMINAL IDENTIFICATION NUMBER, CONNECTIONS ETC. AND REVISE DRAWINGS AS NEEDED TO MATCH EXISTING AND NEW EQUIPMENT TO PROVIDE A COMPLETE FUNCTIONAL SYSTEM.
- ALL CT WIRES SHALL BE #10 AWG MINIMUM, TYPE SIS.
- ALL VOLTAGE, CPT SECONDARY AND BREAKER TRIP WIRES SHALL BE #12 AWG MINIMUM, TYPE SIS. U.O.N.
- CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.
- CPT AND VT'S SHALL BE DRAWOUT TYPE.
- SEE DRAWING E9 FOR THREE LINE DIAGRAM AND E10 FOR BREAKER CONTROL DIAGRAM. SEE DRAWING E80 FOR NAMEPLATE SCHEDULE.
- SEE DRAWING E2 FOR EXISTING/DEMOLITION ONE LINE DIAGRAM.

SUBSTATION OUTSIDE BUILDING 202



ONE LINE DIAGRAM-NEW WORK
SCALE: NTS

BASE BID

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Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

- KEY NOTES**
- PROVIDE NEW OUTDOOR LIQUID-FILLED 750kVA TRANSFORMER T310 WITH DUAL RATED PRIMARY WINDING, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
 - PROVIDE NEW OUTDOOR 480Y/277V 1200A SWITCHBOARD SWBD #1 WITH DRAW-OUT TYPE POWER MAIN CIRCUIT BREAKER WITH GFP AND MOLDED CASE FEEDER CIRCUIT BREAKERS.
 - PROVIDE 15kV, 3-1/C-350kCMIL, 133% INSULATION, EPR CABLE AND 1/C #4 GND FROM SW464 TO VCB751 VIA MH E36.
 - PROVIDE 15kV, 1200A VACUUM CIRCUIT BREAKER SWITCHGEAR VCB751 INCLUDING CPT, VT AND ALL ACCESSORIES PER SPECIFICATION SECTION 26 13 00.00 20.
 - INSTALL GFE 3-PHASE MICROPROCESSOR BASED RELAY ALSTOM MICOM P124 COMPLETELY WIRED ON THE NEW SWITCHGEAR. INSTALLATION SHALL BE IN ACCORDANCE WITH DRAWINGS E81 & E85.

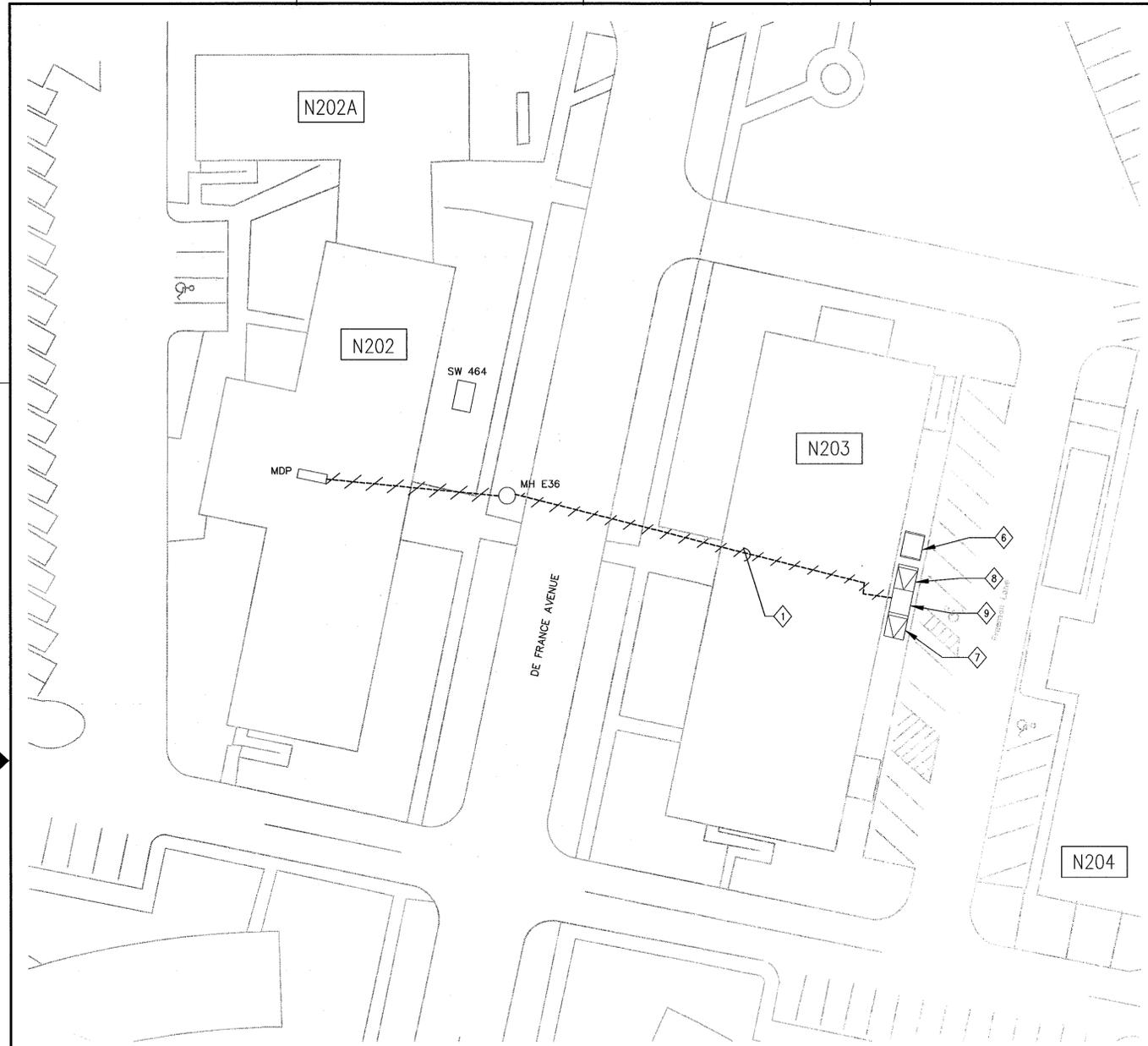
- KEY NOTES**
- INSTALL GFE 3-PHASE DIGITAL POWER METER, PML ION 7330 COMPLETELY WIRED TO THE NEW SWITCHGEAR. INSTALLATION SHALL BE IN ACCORDANCE WITH DRAWING E85. SEE KEY NOTE 12.
 - INSTALL GFE 3-PHASE DIGITAL POWER METER, PML ION 7330 COMPLETELY WIRED TO THE NEW EQUIPMENT. SEE KEY NOTE 13 ON DRAWING E7 FOR CONNECTION DETAILS. PROVIDE VOLTAGE CONNECTION FROM BUS.
 - PROVIDE NEW 600V, 1 SET OF 3-1/C-500kCMIL AND 1 #3 GND IN NEW 3" CONDUIT. APPROXIMATE DISTANCE IS 100 FEET.
 - PROVIDE NEW 600V, 2 SETS OF 4-1/C-500kCMIL AND 1 #1/0 GND IN NEW (2)-3 1/2" CONDUITS. APPROXIMATE DISTANCE IS 60 FEET.
 - PROVIDE NEW 600V, 1 SET OF 4-1/C-500kCMIL AND 1 #3 GND IN NEW 3 1/2" CONDUIT. APPROXIMATE DISTANCE IS 280 FEET.

- KEY NOTES**
- PROVIDE NEW 600V, 1 SET OF 4-1/C-500kCMIL AND 1 #3 GND IN NEW 3 1/2" CONDUIT. APPROXIMATE DISTANCE IS 100 FEET.
 - SEE DRAWING E7 FOR PULL BOX SIZE AND LOCATION.
 - PROVIDE NEW INDOOR 225kVA, 480-208Y/120V DRY TYPE TRANSFORMER T-1, ELECTROSTATIC SHIELDED, TOTALLY ENCLOSED, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 11 16.

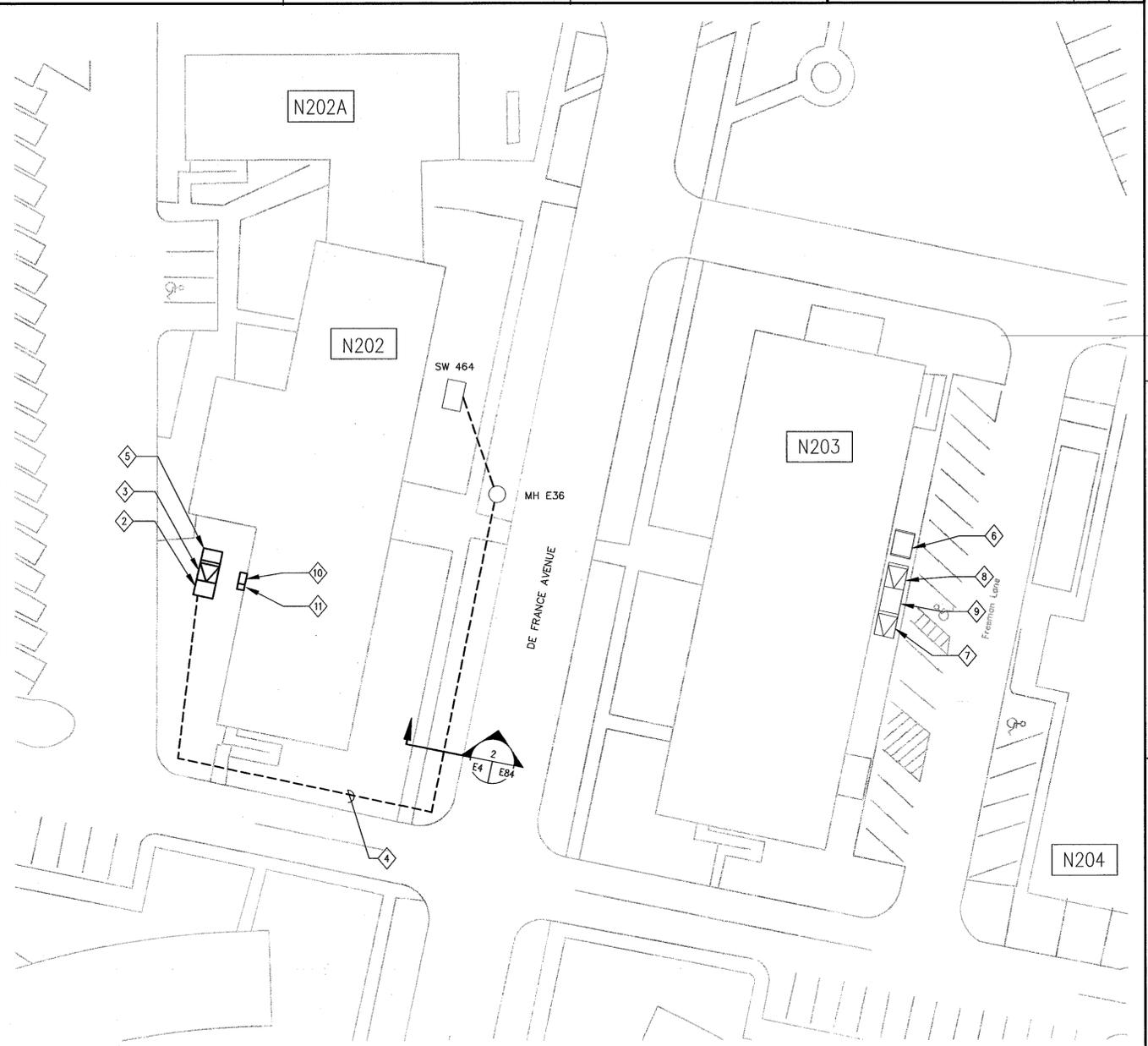
ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
1					
Ames Research Center Moffett Field, California RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII N202 & N202A OUTDOOR SUBSTATION ELECTRICAL ONE LINE DIAGRAM NEW WORK					
DATE	DATE	DATE	DATE	DATE	DATE
4.30.09	4.30.09	4.30.09	4.30.09	4.30.09	4.30.09
DESIGNED	CHECKED	PROJENGR	REQUESTER	R&C	SAFETY
N.NIZAMOVA	J.MCCLUSKER	N.NIZAMOVA	N.HSU		
DATE	DATE	DATE	DATE	DATE	DATE
4.30.09	4.30.09	4.30.09	4.30.09	4.30.09	4.30.09
SUPERVISOR		DATE	SCALE	CAGE CODE	INDEX
S.FRANKEL		4.30.09	1"=20'	25307	A1---0810-E3
SHEET 1 OF 1					

DWG: \\F:\19-m3\cadd\ARC\REDS\REDS Phase VIII\900_CAD\N202_Outdoor Substation\Sheet\A1---0810-E003_1_RB.dwg Version: 17.1s (LMS Tech) User: palden
 DATE: Apr 29, 2009 9:19:36 am

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A SITE PLAN - DEMOLITION
SCALE: 1"=300'



B SITE PLAN - NEW WORK
SCALE: 1"=300'

BASE BID

SHEET NOTES

- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON THE DRAWING.
- HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED, U.O.N.
- CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS AT THE SITE AND SHALL BE RESPONSIBLE FOR THEIR ACCURACY PRIOR TO STARTING ANY WORK OR ORDERING ANY MATERIAL.

KEY NOTES

- DISCONNECT AND REMOVE (E) CABLES FROM 480Y/277V, 1000A SWITCHBOARD LOCATED OUTSIDE THE BUILDING N203 TO MAIN DISTRIBUTION PANELS IN BUILDINGS N202, 202A. SEE ONE LINE DIAGRAM ON DRAWING E2 FOR WIRE SIZE.
- PROVIDE NEW 15KV, 1200A SWITCHGEAR WITH VACUUM CIRCUIT BREAKER VCB751, CPT, VT AND ALL ACCESSORIES PER SPECIFICATION SECTION 26 13 00.00 20.
- PROVIDE NEW OUTDOOR LIQUID-FILLED 750KVA TRANSFORMER T-310 WITH DUAL RATED PRIMARY WINDING, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- PROVIDE AND INSTALL 3-1/2" 350KCMIL, 15KV, EPR AND 1 # 4 GND FROM SW 464 (WAY 3) TO VCB751 IN NEW 4" CONDUIT.
- PROVIDE NEW OUTDOOR 480Y/277V, 1200A, 3PH, 4W SWITCHBOARD SWBD #1 WITH 1200A DRAW-OUT TYPE POWER MAIN CIRCUIT BREAKER WITH GFP AND MOLDED CASE FEEDER CIRCUIT BREAKERS. SEE DRAWING E3 FOR ONE LINE DIAGRAM.
- EXISTING SWITCHGEAR WITH VACUUM CIRCUIT BREAKER VCB490.
- EXISTING OUTDOOR LIQUID-FILLED 750KVA TRANSFORMER T120.
- EXISTING OUTDOOR LIQUID-FILLED 500KVA TRANSFORMER T119.

- EXISTING LOW VOLTAGE SWITCHBOARD.
- PROVIDE NEW 24"(W)x28"(H)x28"(D) EXTERIOR POWER PULL BOX 'PB-1'. INSTALL ON THE WALL. PROVIDE SEAL AROUND PULL BOX.
- PROVIDE NEW 12"(W)x28"(H)x28"(D) EXTERIOR TELECOMMUNICATION PULL BOX 'PB-3'. INSTALL ON THE WALL. PROVIDE SEAL AROUND PULL BOX.

Approved for Construction
Moffett Field Permit Board
N. Nizamova
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DRAWN	N.NIZAMOVA	DATE	4/30/09		
DESIGNED	N.NIZAMOVA	DATE	4/30/09		
CHECKED	J.MCCUSKER	DATE	4/30/09		
PROJECT	N.NIZAMOVA	DATE	4/30/09		
REQUESTER	N.HSU	DATE	4/30/09		
R&QA		DATE			
SAFETY					
SUPERVISOR					
S.FRANKEL					
DATE					
5-1-09					
SIZE	CAGE CODE		REV		
D	25307		A1---0810-E4		
SCALE:	INDEX	SHEET		1 OF 1	

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N202 & N202A OUTDOOR SUBSTATION
ELECTRICAL

**SITE PLANS
DEMOLITION & NEW WORK**

DWG: \\f119-n13\cadd\ARC\REDS\REDS Phase WIN\500_CAD\N202_Outdoor_Substation\Sheet\A1---0810-E004_1_R8.dwg User: pdalen
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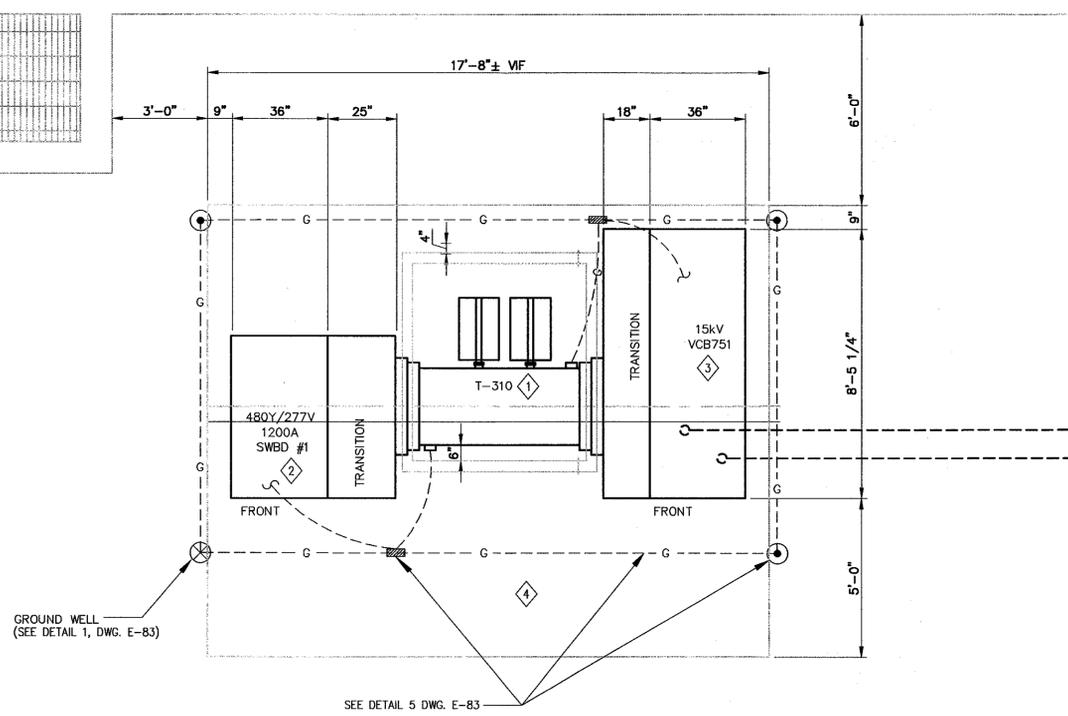
SHEET NOTES

1. FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4.
2. LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
3. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
4. CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.
5. ALL EXISTING CONDUITS AND CONDUCTORS SHALL BE RECONNECTED TO NEW EQUIPMENT. CONTRACTOR SHALL DETERMINE IN FIELD AND PROVIDE PULL BOXES AND RELOCATE/EXTEND OR REPLACE (E) CONDUITS AND CONDUCTORS (MATCH EXISTING SIZE) TO COMPLETE CONNECTIONS TO NEW AND EXISTING EQUIPMENT.
6. SEE STRUCTURAL DRAWINGS S2, S7 AND S9 FOR CONCRETE PAD DETAILS.

KEY NOTES

- 1 PROVIDE NEW OUTDOOR LIQUID-FILLED 750kVA TRANSFORMER T310 WITH DUAL RATED PRIMARY WINDING, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- 2 PROVIDE NEW OUTDOOR 480Y/277V 1200A SWITCHBOARD SWBD #1 WITH 1200A DRAW-OUT TYPE MAIN POWER CIRCUIT BREAKER WITH GFP AND MOLDED CASE FEEDER CIRCUIT BREAKERS.
- 3 PROVIDE 15kV, 1200A VACUUM CIRCUIT BREAKER SWITCHGEAR VCB751 INCLUDING CPT, VT AND ALL ACCESSORIES PER SPECIFICATION SECTION 26 13 00.00 20.
- 4 AT THE COMPLETION OF CONSTRUCTION, PROVIDE AND INSTALL NEW REPLACEMENT SHRUBS ADJACENT TO THE CURB. PLANT NEW 5 GALLON SHRUBS AT 36" ON THE CENTER TO ENTIRELY FILL THE AREA WHERE THE EXISTING SHRUBS WERE REMOVED. SHRUBS SHALL BE EITHER MYRTICA CALIFORNICA, HETEROMELES OR CERCOCARPUS WITH THE FINAL PLANT SELECTION TO BE MADE BY THE NASA PROJECT MANAGER.

N202



1 EQUIPMENT PLAN
SCALE: 3/32"=1'-0"

BASE BID

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN N.NIZAMOVA	<i>[Signature]</i>	DATE 4/30/09
DESIGNED N.NIZAMOVA	<i>[Signature]</i>	DATE 4/30/09
CHECKED J.McCUSKER	<i>[Signature]</i>	DATE 4/30/09
PROJ.MGR N.NIZAMOVA	<i>[Signature]</i>	DATE 4/30/09
REQUESTER N.HSU	<i>[Signature]</i>	DATE 4/30/09
R&QA		
SAFETY		
SUPERVISOR S.FRANKEL	<i>[Signature]</i>	DATE 4/30/09

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM—PHASE VIII
N202 & N202A OUTDOOR SUBSTATION
ELECTRICAL

**SUBSTATION EQUIPMENT PLAN
NEW WORK**

SIZE D	CADE CODE 25307	FILE NAME: A1---0810-E005_1_R8.DWG
SCALE:	INDEX	SHEET 1 OF 1

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DWG NO. A1---0810-E6

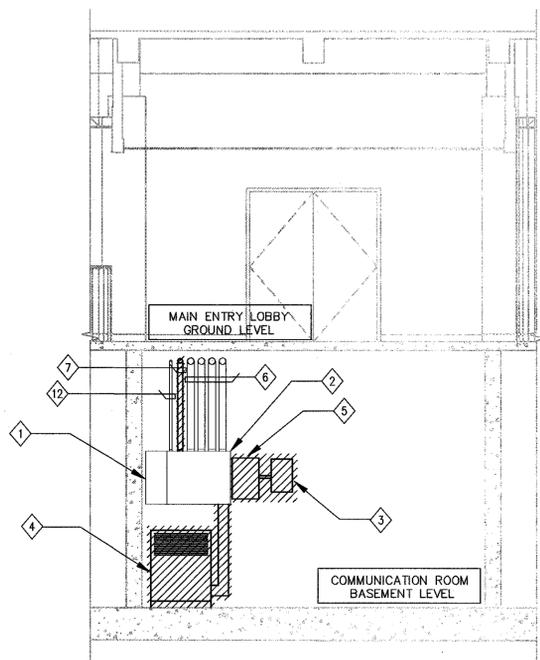
SHT 1 REV

SHEET NOTES

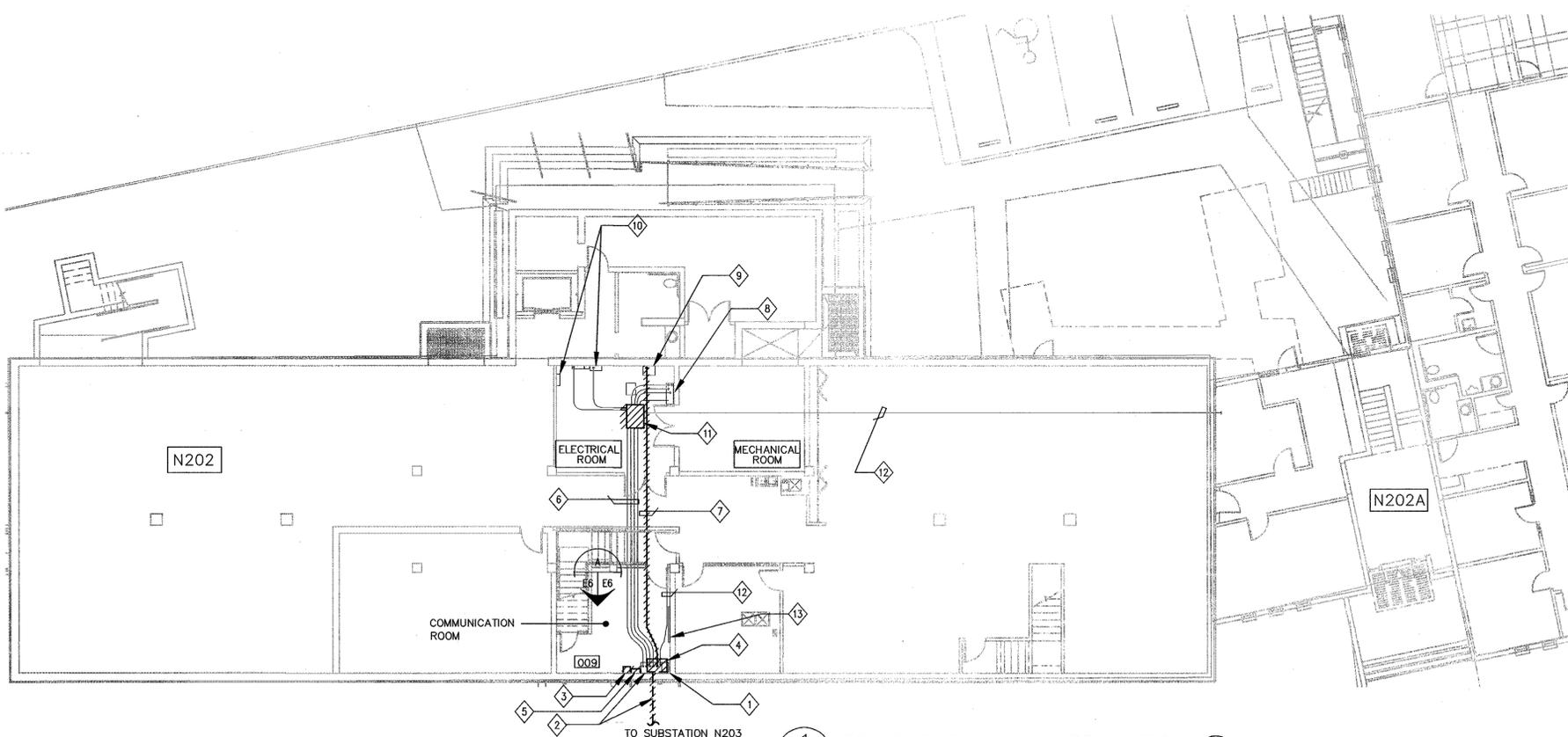
- FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4.
- LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
- DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.
- EXISTING CONDUITS AND CONDUCTORS SHALL BE RECONNECTED TO NEW EQUIPMENT. CONTRACTOR SHALL DETERMINE IN FIELD AND PROVIDE PULL BOXES AND RELOCATE/EXTEND OR REPLACE (E) CONDUITS AND CONDUCTORS (MATCH EXISTING SIZE) TO COMPLETE CONNECTIONS TO NEW AND EXISTING EQUIPMENT.
- CONTRACTOR SHALL REPAIR, PATCH AND PAINT WALLS WHERE ELECTRICAL EQUIPMENT WAS REMOVED.

KEY NOTES

- EXISTING COMMUNICATION PULL BOX TO REMAIN.
- EXISTING POWER PULL BOX TO REMAIN. CONTRACTOR SHALL REMOVE ALL INCOMING CABLES FROM SUBSTATION N203 AND PATCH THE EXTERIOR WALL.
- EXISTING APMS-204 SHALL BE DISCONNECTED, REMOVED AND TURNED OVER TO THE GOVERNMENT. REMOVE ALL ASSOCIATED CONDUITS AND WIRES.
- EXISTING DRY TYPE 225kVA, 480-208Y/120V TRANSFORMER (LOCATED BELOW POWER PULL BOX) SHALL BE DEMOLISHED. ALL WIRES SHALL BE DISCONNECTED AND REMOVED.
- EXISTING 300A MAIN CIRCUIT BREAKER FOR MCC SHALL BE RELOCATED TO THE ELECTRICAL ROOM. SEE DRAWING E7 FOR NEW LAYOUT.
- EXISTING CONDUITS SHALL REMAIN AND REUSED IN NEW WORK. EXISTING WIRES FROM 225kVA TRANSFORMER TO PANEL 'MDP' SHALL BE DISCONNECTED AND REMOVED. EXISTING WIRES FOR BUILDING N202A SHALL BE PULLED UP TO EXISTING PULL BOX IN ELECTRICAL ROOM, COILED AND TAGGED INSIDE THE PULL BOX FOR REUSE IN NEW INSTALLATION.
- EXISTING CONDUIT FROM 300A CIRCUIT BREAKER TO MCC LOCATION SHALL BE DEMOLISHED. WIRES SHALL BE DISCONNECTED AND REMOVED.
- EXISTING MAIN DISTRIBUTION PANELBOARD 'MDP' TO REMAIN.
- EXISTING MCC SHALL BE DISCONNECTED FROM EXISTING 300A CIRCUIT BREAKER. CONDUIT SHALL BE DEMOLISHED. SEE DRAWING E7 FOR NEW LOCATION OF EXISTING MAIN CIRCUIT BREAKER.
- EXISTING ELECTRICAL PANELS SHALL BE DISCONNECTED FROM MAIN DISTRIBUTION PANEL 'MDP' DURING CONSTRUCTION. WIRES SHALL BE REMOVED AND SAVED FOR REUSE IN NEW WORK. CONDUITS SHALL BE DISCONNECTED FROM EXISTING PULL BOX AND REUSED IN NEW WORK.
- EXISTING PULL BOX TO BE DEMOLISHED.
- EXISTING ELECTRICAL CONDUIT WITH WIRES TO REMAIN.
- EXISTING COMMUNICATION PANEL TO REMAIN.



A EQUIPMENT ELEVATION - DEMOLITION
E6 E6 SCALE: 3/32"=1'-0"



1 EQUIPMENT PLAN - DEMOLITION
SCALE: 3/32"=1'-0"

BASE BID

Approved for Construction
Moffett Field Permit Board

Met. G.L.
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN N.NIZAMOVA DESIGNED N.NIZAMOVA CHECKED J.MCCUSKER PREPARED N.NIZAMOVA REQUESTER N.HSU R&QA	<i>Shey</i> <i>Shey</i> <i>J</i> <i>Shey</i> <i>N</i>	DATE 4.30.09 DATE 4.30.09 DATE 4.30.09 DATE 4.30.09 DATE 4/30/09
SAFETY	DATE	
SUPERVISOR S.FRANKEL	<i>S Frankel</i>	DATE 4-7-09

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N202 & N202A OUTDOOR SUBSTATION
ELECTRICAL

N202 & N202A BASEMENT PLAN & ELEVATION-EXISTING/DEMOLITION

SIZE D	CAGE CODE 25307	SCALE	INDEX	SHEET 1 OF 1
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FILE NAME:
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DWG NO. A1---0810-E7 SHT 1 REV 1

SHEET NOTES

- 1. FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4.
- 2. LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
- 3. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- 4. CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.
- 5. ALL EXISTING CONDUITS AND CONDUCTORS SHALL BE RECONNECTED TO NEW EQUIPMENT, CONTRACTOR SHALL DETERMINE IN FIELD AND PROVIDE PULL BOXES AND RELOCATE/EXTEND OR REPLACE (E) CONDUITS AND CONDUCTORS (MATCH EXISTING SIZE) TO COMPLETE CONNECTIONS TO NEW AND EXISTING EQUIPMENT.
- 6. ALL ELECTRICAL CONDUITS SHALL BE SECURELY FASTENED IN PLACE IN ACCORDANCE WITH CEC, SECTION 358.30.

KEY NOTES

- 1 EXISTING COMMUNICATION PULL BOX.
- 2 EXISTING POWER PULL BOX SHALL BE USED IN NEW CONSTRUCTION.
- 3 NEW LOCATION OF EXISTING 300A MAIN CIRCUIT BREAKER FOR N202 AIR CONDITIONING EQUIPMENT (MCC). PROVIDE METAL STRUCTURE TO SUPPORT CIRCUIT BREAKER. RESTORE ALL CONNECTIONS AS SHOWN ON DRAWING E3-ONE LINE DIAGRAM AND ON THIS DRAWING.
- 4 RECONNECT EXISTING MAIN DISTRIBUTION PANEL 'MDP' IN N202 TO NEW TRANSFORMER T-1 AS SHOWN ON ONE LINE DIAGRAM - DRAWING E3.
- 5 EXISTING MCC SHALL BE RECONNECTED TO 300A CIRCUIT BREAKER AS SHOWN ON THE DRAWING AND ON ONE LINE DIAGRAM-DRAWING E3.
- 6 EXISTING ELECTRICAL PANELS SHALL BE RECONNECTED TO EXISTING MAIN DISTRIBUTION PANEL 'MDP' AS SHOWN ON THE DRAWING.
- 7 PROVIDE NEW 40"(L)x39"(W)x18"(H) PULL BOX. LABEL 'PB-2'. SEE DRAWING S9 FOR INSTALLATION DETAILS.
- 8 PROVIDE NEW 225KVA, 480-208Y/120V DRY TYPE DISTRIBUTION TRANSFORMER T1, ELECTROSTATIC SHIELDED, TOTALLY ENCLOSED.
- 9 EXISTING COMMUNICATION PANEL.
- 10 PROVIDE NEW 24"(W)x28"(D)x28"(H) EXTERIOR PULL BOX. LABEL 'PB-1'.
- 11 EXISTING CONDUITS SHALL BE REUSED IN NEW WORK.
- 12 PROVIDE CAT 5E ETHERNET CABLE FROM APMS #129 IN MV SWITCHGEAR TO COMMUNICATION PANEL IN ROOM # 009 IN THE BASEMENT. PULL CABLES INTO 2" CONDUIT.
- 13 PROVIDE (3) CAT 5E ETHERNET CABLES, ONE FROM EACH APMS IN LV SWITCHBOARD (APMS #204, APMS #205 & APMS #228) TO COMMUNICATION PANEL IN ROOM # 009 IN THE BASEMENT. PULL CABLES INTO 2" CONDUIT.
- 14 PROVIDE 1-3" C WITH 3-1/C-500KCMIL & 1 # 3 GND FROM SWBD # 1 TO TRANSFORMER T-1 IN N202 (RM 009), 1-3 1/2" C WITH 4-1/C-500KCMIL & 1 # 3 GND FROM SWBD # 1 TO CB FOR AIR CONDITIONING EQUIPMENT IN N202 (ELECTRICAL ROOM) AND 1-3 1/2" C WITH 4-1/C-500KCMIL & 1 # 3 GND TO N202A. SEE ONE LINE DIAGRAM ON E3 FOR DETAILS.
- 15 PROVIDE 12"W x 28"H x 28"D EXTERIOR TELECOMMUNICATION PULL BOX. LABEL 'PB-3'.
- 16 EXISTING 4" CONDUIT WITH WIRES TO N202A. SEE ONE LINE DIAGRAM ON E3 FOR DETAILS.
- 17 PROVIDE (1) 2" CONDUIT FOR ETHERNET CABLES DESCRIBED IN NOTES AND . INSTALL CONDUIT NOT MORE THEN 5 FEET FROM THE PANEL. PROVIDE ADDITIONAL 25 FEET OF CABLE AND RJ-45 CONNECTORS AT EACH END. ETHERNET CABLE HOOK UP TO COMMUNICATION PANEL AND APMS #129, #204, #205 & #228 WILL BE PERFORMED BY OTHERS. APPROXIMATE DISTANCE FROM APMSs TO COMMUNICATION PANEL IS 130 FEET.

BASE BID

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	N.NIZAMOVA	DATE	4/30/09
DESIGNED	N.NIZAMOVA	DATE	4/30/09
CHECKED	J.MCCUSKER	DATE	4/30/09
PROJECT	N.NIZAMOVA	DATE	4/30/09
REQUESTER	N.HSU	DATE	4/20/09
R&QA		DATE	
SAFETY		DATE	
SUPERVISOR	S.FRANKEL	DATE	5-5-09

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII
N202 & N202A OUTDOOR SUBSTATION
ELECTRICAL

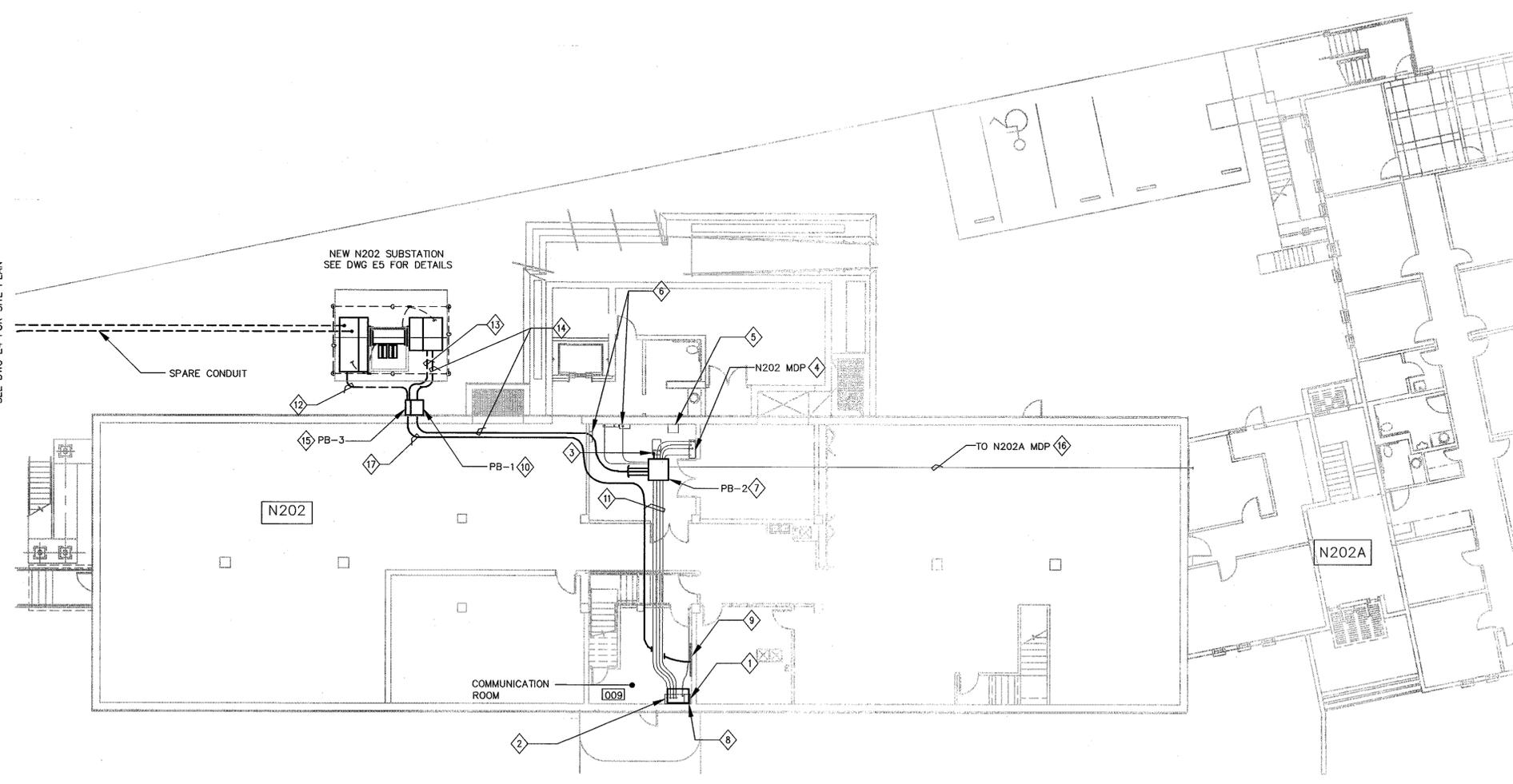
**N202 & N202A BASEMENT PLAN
& ELEVATION-NEW WORK**

SIZE: D CAGE CODE: 25307
SCALE: INDEX SHEET 1 OF 1

FILE NAME: A1---0810-E7_1_R8.DWG 4-30-09

1 EQUIPMENT PLAN - NEW WORK
SCALE: 3/32"=1'-0"

TO SW464 (THROUGH MH E36)
SEE DWG E4 FOR SITE PLAN



DWG: \\Fe19-m3\cad\ARC\REDS\REDS Phase VII\500_CAD\N202_Outdoor_Substation\E_Sheet\A1---0810-E07_1_R8.dwg User: polden
 Version: 17.1s (LMS Tech)
 DATE: Apr 29, 2009 9:20:06 am

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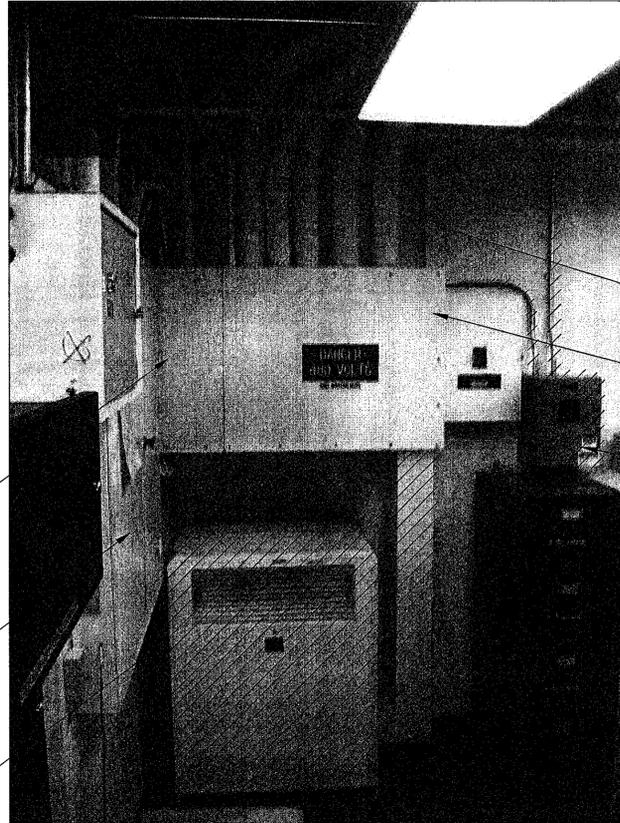
SHT REV

SHEET NOTES

- HATCHED LINES INDICATE EXISTING MATERIALS AND EQUIPMENT TO BE DEMOLISHED AND REMOVED.
- SEE DRAWING E6 FOR EQUIPMENT LAYOUT-EXISTING/DEMOLITION.

KEY NOTES

- DISCONNECT AND REMOVE THE EXISTING TRANSFORMER.
- DISCONNECT AND REMOVE EXISTING POWER PULL BOX. CONDUITS SHALL BE SAVED FOR NEW INSTALLATION.
- EXISTING POWER PULL BOX TO REMAIN. CONTRACTOR SHALL REMOVE ALL INCOMING CABLES FROM SUBSTATION N203 AND PATCH THE EXTERIOR WALL.
- EXISTING COMMUNICATION PULL BOX TO REMAIN.
- EXISTING APMS SHALL BE DISCONNECTED, REMOVED AND TURNED OVER TO THE GOVERNMENT.
- EXISTING 300A MAIN CIRCUIT BREAKER FOR MCC SHALL BE DISCONNECTED, REMOVED AND REINSTALLED IN ELECTRICAL ROOM. SEE DRAWING E7 FOR NEW LOCATION OF CIRCUIT BREAKER.
- DISCONNECT AND REMOVE WIRES FROM MAIN CIRCUIT BREAKER TO MCC IN ELECTRICAL ROOM. REMOVE CONDUIT.
- EXISTING COMMUNICATION PANEL TO REMAIN.



1 COMMUNICATION ROOM PULL BOX DETAIL
E5 E7 SCALE:



2 ELECTRICAL ROOM PULL BOX DETAIL
E5 E7 SCALE:

BASE BID

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN N.NIZAMOVA	<i>[Signature]</i>	DATE 4/30/09
DESIGNED N.NIZAMOVA	<i>[Signature]</i>	DATE 4/30/09
CHECKED J.MCCUSKER	<i>[Signature]</i>	DATE 4/30/09
PROJECTOR N.NIZAMOVA	<i>[Signature]</i>	DATE 4/30/09
REQUESTER N.HSU	<i>[Signature]</i>	DATE 4/30/09
R&QA		DATE
SAFETY		DATE
SUPERVISOR S.FRANKEL	<i>[Signature]</i>	DATE 5-7-09

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N202 & N202A OUTDOOR SUBSTATION
ELECTRICAL

PHOTO DETAILS EXISTING/DEMOLITION

SIZE D	CAGE CODE 25307	INDEX	SHEET OF
SCALE:	FILE NAME: A1---0810-E008_1_R8.DWG	DATE: 4-30-09	REV

DWG: \\F:\119-113\ccid\ARC\ARC\REDS\REDS Phase VII\500_CAD\N202_Outdoor Substation\E\Sheet\A1---0810-E008_1_R8.dwg Version: 17.1a (LMS Tech) User: pdiden
 DATE: Apr 29, 2009 9:20:18 am

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SHEET NOTES

- 1. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- 2. THE DIAGRAM IS PROVIDED FOR GUIDANCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT INCLUDING TERMINAL BLOCKS, TERMINAL IDENTIFICATION NUMBER, CONNECTIONS ETC. AND REVISE DRAWINGS AS NEEDED TO MATCH EXISTING AND NEW EQUIPMENT TO PROVIDE A COMPLETE FUNCTIONAL SYSTEM.
- 3. ALL CT WIRES SHALL BE #10 AWG MINIMUM, TYPE SIS. ALL VOLTAGE, CPT SECONDARY AND BREAKER TRIP WIRES SHALL BE #12 AWG MINIMUM, TYPE SIS. U.O.N.

KEY NOTES

- 1 PROVIDE NEW 15KV, 1200A SWITCHGEAR WITH 15KV VACUUM CIRCUIT BREAKER VCB751 AND ACCESSORIES PER SPECIFICATION.
- 2 INSTALL NEW GFE ALSTOM RELAY COMPLETELY WIRED TO THE NEW SWITCHGEAR.
- 3 INSTALL NEW GFE DIGITAL POWER METER COMPLETELY WIRED TO THE NEW SWITCHGEAR. SEE KEY NOTE 12 ON DRAWING E7 FOR CONNECTION DETAILS.
- 4 PROVIDE FUSE BLOCK, FLEXCORE KLK-3 OR APPROVED EQUAL.
- 5 PROVIDE (4) CIRCUIT SHORTING TERMINAL BLOCKS (SCTB), FLEXCORE 1KU6SC OR APPROVED EQUAL.
- 6 PROVIDE (2) SETS OF 3 WINDOW-TYPE MULTI-RATIO CT'S ON THE LINE SIDE OF THE BREAKER.
- 7 PROVIDE (2) ADDITIONAL SPARE SETS OF CT'S ON THE LOAD SIDE OF THE BREAKER. ALL CT'S SHALL BE C200 ACCURACY.

BASE BID

Approved for Construction
Moffett Field Permit Board
Mts lola
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD

DRWN	DATE
N.NIZAMOVA	4.30.09
DESIGNED	DATE
N.NIZAMOVA	4.30.09
CHECKED	DATE
J.MCCUSKER	4.30.09
PROJMR	DATE
N.NIZAMOVA	4.30.09
REQUESTER	DATE
N.HSU	4.30.09
R/QCA	DATE

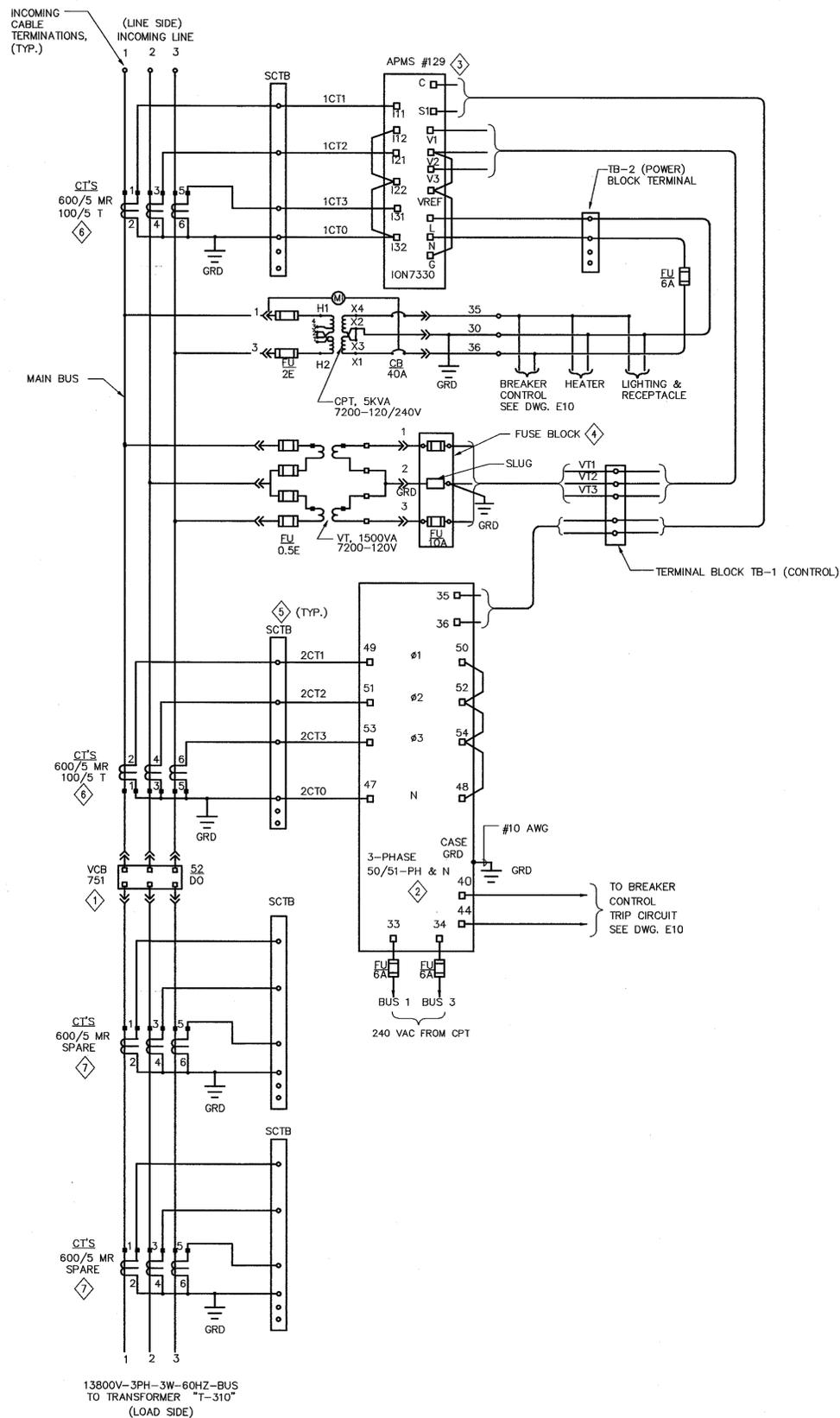
Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII
N202 & N202A OUTDOOR SUBSTATION
ELECTRICAL

THREE LINE DIAGRAM
NEW WORK

SUPERVISOR	DATE	SIZE	CAGE CODE	INDEX	SHEET	OF
S.FRANKEL	4-2-09	D	25307	A1---0810-E9	1	1

FILE NAME: A1---0810-E009_1_R8.DWG 4-30-09



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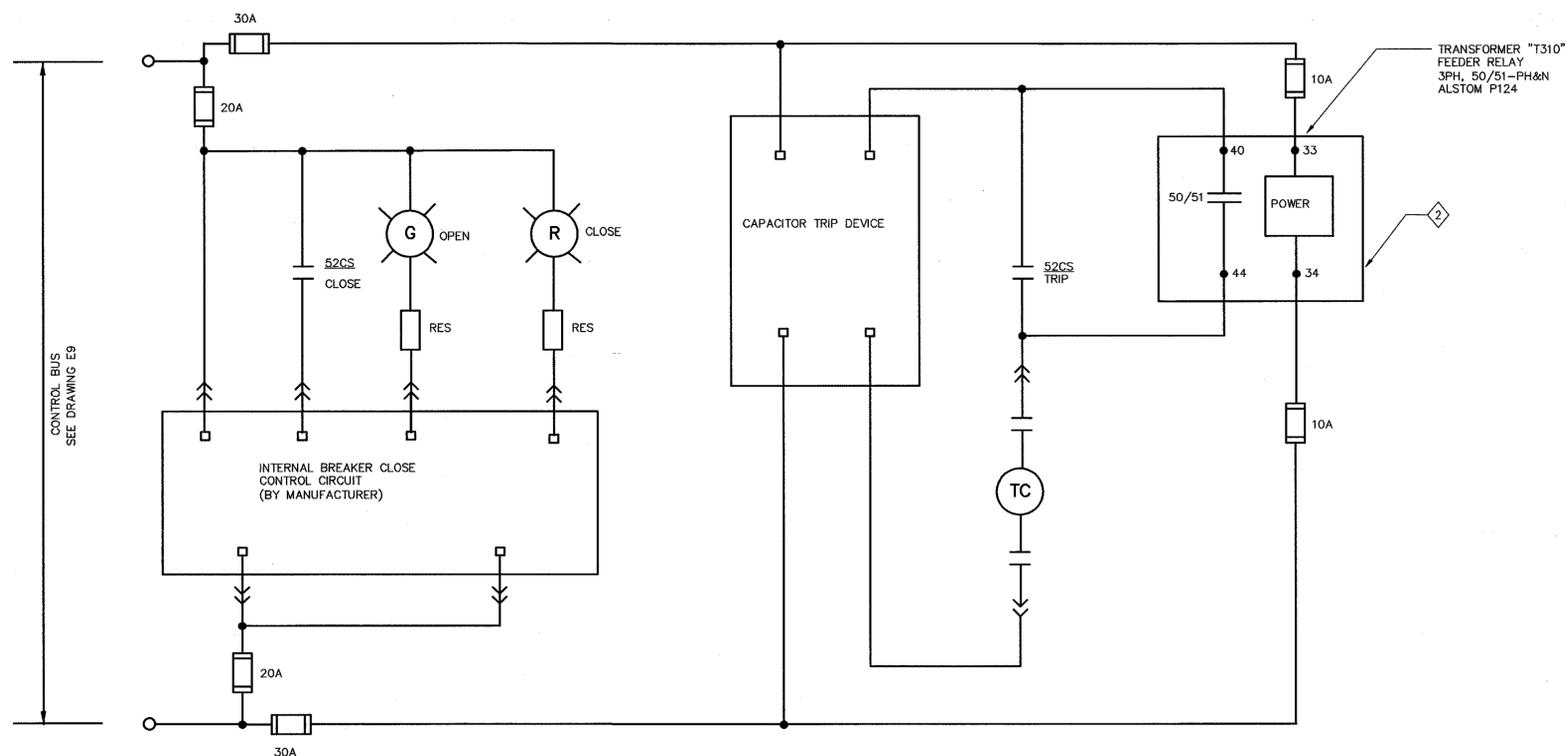
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SHEET NOTES

- 1. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- 2. TERMINAL MARKINGS ARE BASED ON CUTLER HAMMER INFORMATION.

KEY NOTES

- 1 TYPICAL BREAKER CONTROL DIAGRAM WITH THE RELATED TRANSFORMER FEEDER RELAYS. FOR SUBSTATION ONE LINE DIAGRAM AND THREE LINE DIAGRAM, REFER TO THE DRAWINGS E3 AND E9 RESPECTIVELY.
- 2 INSTALL NEW GFE 3-PHASE MICROPROCESSOR BASED RELAY, ALSTOM MICOM P124 COMPLETELY WIRED INTO THE EQUIPMENT.



VCB751 BREAKER CONTROL DIAGRAM - NEW WORK
 SCALE: NTS

BASE BID

Approved for Construction
 Moffett Field Permit Board
 Chief Building Official
 Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD

DESIGNED		DATE	 Ames Research Center Moffett Field, California
N.NIZAMOVA	Shef	4.30.09	
CHECKED		DATE	RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII N202 & N202A OUTDOOR SUBSTATION ELECTRICAL
J.McCUSKER	Shef	4.30.09	
PROJ.MGR		DATE	VCB751 BREAKER CONTROL DIAGRAM-NEW WORK
N.NIZAMOVA	Shef	4.30.09	
REQUESTER		DATE	SIZE D CAGE CODE 25307 SCALE: INDEX SHEET 1 OF 1
N.HSU	Shef	4.30.09	
R&QA		DATE	FILE NAME: A1---0810-E010_1_RB.DWG 4-30-09
SUPERVISOR	S.FRANKEL	DATE	
S.FRANKEL	Shef	4.30.09	

DWG: \\f119-r13\cadd\ARC\REDS Phase VII\500_CAD\N202_Outdoor Substation\A1---0810-E010_1_RB.dwg Version: 17:1s (LMS Tech) User: pdallen
 DATE: Apr 29, 2009 - 9:26:30 am

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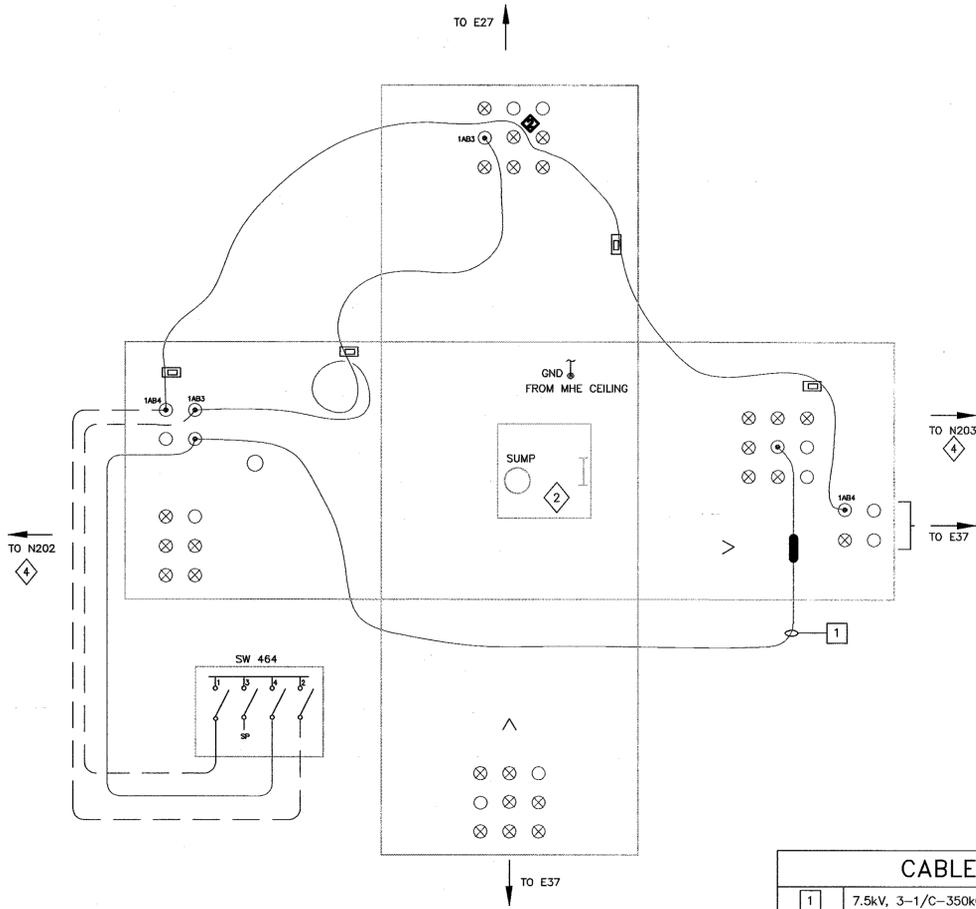
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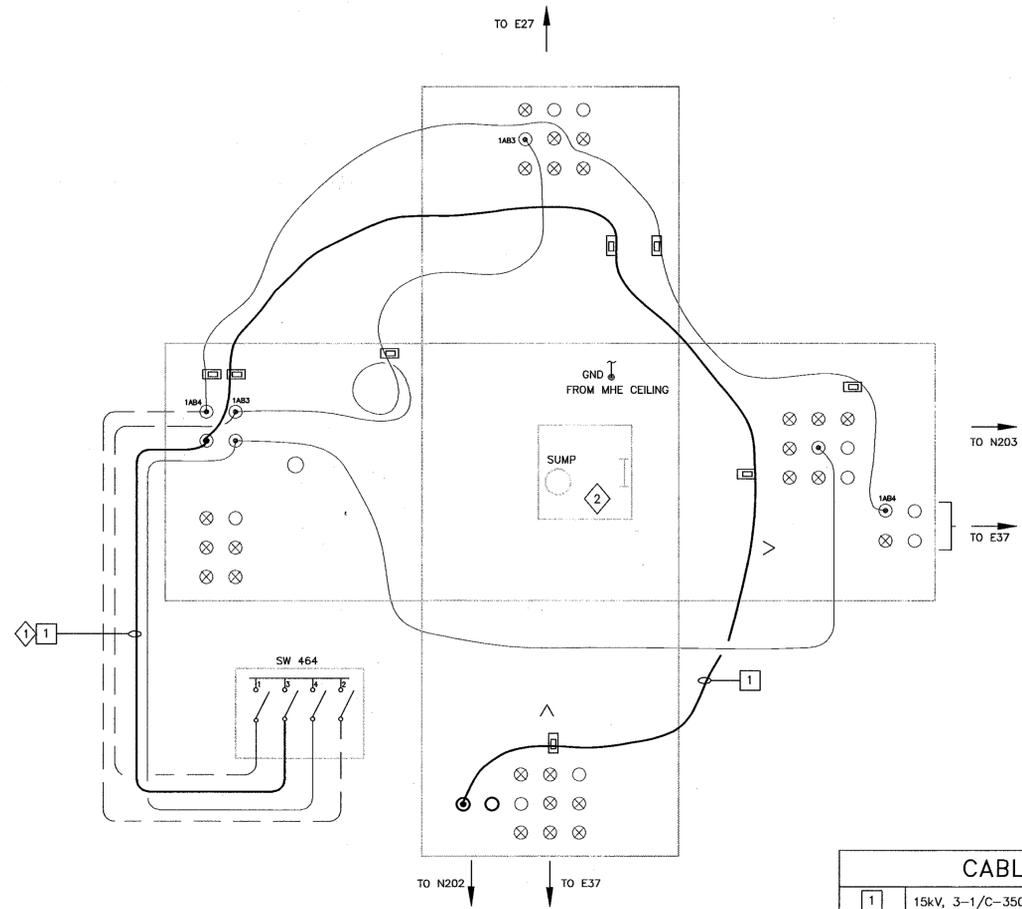
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CABLE DESCRIPTION	
1	7.5kV, 3-1/C-350kCML CABLE

1 MANHOLE NO. E36 DETAIL - EXISTING/DEMO
SCALE: NTS (De France Ave. East OF N202)



CABLE DESCRIPTION	
1	15kV, 3-1/C-350 kCML, 133%INS., EPR CABLE & 1/C # 4 GND

2 MANHOLE NO. E36 DETAIL - NEW WORK
SCALE: NTS (De France Ave. East OF N202)

BASE BID

SHEET NOTES

- SHEET NOTES #1,2,3 ARE NOT PART OF THIS CONTRACT (THE INTENTION IS FOR NASA "IN-HOUSE" USE).
- THIS DRAWING IS NOT THE CONTROLLED NASA AMES CONFIGURATION MANAGEMENT BASELINE DRAWING.
- THE AMES CONFIGURATION MANAGEMENT BASELINE DRAWING THAT WAS USED TO CREATE THE PROJECT DRAWING IS A1---9801-E36.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON DRAWING.
- CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS AT THE SITE AND SHALL BE RESPONSIBLE FOR THEIR ACCURACY PRIOR TO STARTING ANY WORK OR ORDERING ANY MATERIAL.
- UPON COMPLETION OF CABLE WORK AND PRIOR ENERGIZATION, CONTRACTOR SHALL INFORM GOVERNMENT FOR TAKING AS-BUILT PHOTOS AND UPDATING OF NASA REFERENCE DWG.
- FOR N202 OUTDOOR SUBSTATION SITE PLAN - NEW WORK SEE DRAWING E4.
- LIGHT LINES INDICATE EXISTING CONDITION AND DARK LINES INDICATE NEW WORK.
- NEW CABLE ROUTING INSIDE THE MANHOLE IS SHOWN DIAGRAMMATICALLY. EXACT CABLE ROUTING INSIDE MANHOLE SHALL BE IN ACCORDANCE WITH DWG E86.

KEY NOTES

- PROVIDE 15kV, 3-1/C-350kCML, 133 % INS., EPR CABLE AND 1/C # 4 GND FROM SW464 TO VCB 751. INSTALL FEEDER IDENTIFICATION TAG & PHASE IDENTIFICATION COLOR TAPE.
- MANHOLE OPENING SIZE: 42" x 42" x 27" DEEP.
- ALL INFORMATION INCLUDED IN THIS DETAIL IS CONSIDERED AS EXISTING CONDITIONS BASED ON LATEST KNOWN EXISTING DRAWINGS.
- PULL OUT AND DISPOSE OFF ALL CABLES FROM SUBSTATION N203 TO BUILDING N202.

NASA REFERENCE DRAWINGS

A1---9801-E36 UNDERGROUND POWER DISTRIBUTION MANHOLE E36 DETAIL.

Approved for Construction
Moffett Field Permit Board
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Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DESIGNED	N.NIZAMOVA	DATE	4.30.09		
CHECKED	J.McCUSKER	DATE	4.30.09		
PROJ.MGR	N.NIZAMOVA	DATE	4.30.09		
REQUESTER	N.HSU	DATE	4/20/09		
R&GA		DATE			
SAFETY					
SUPERVISOR					
S.FRANKEL		DATE	5-7-09		

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N202 & N202A OUTDOOR SUBSTATION
ELECTRICAL

MHE36 DETAILS
EXISTING/DEMO & NEW WORK

SIZE	D	CAGE CODE	25307
SCALE	NONE	INDEX	
SHEET	1	OF	1

FILE NAME:
A1---0810-E011_R8.DWG 4-30-09

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DWC: \\f19-m3\cadd\ARC\ARC\REDS\REDS Phase VII\500_CAD\N202_Outdoor_Substation\Sheet\A1---0810-E011_R8.dwg User: pdallen Version: 17.1s (LMS Tech) Date: Apr 29, 2009 - 9:26:52 am

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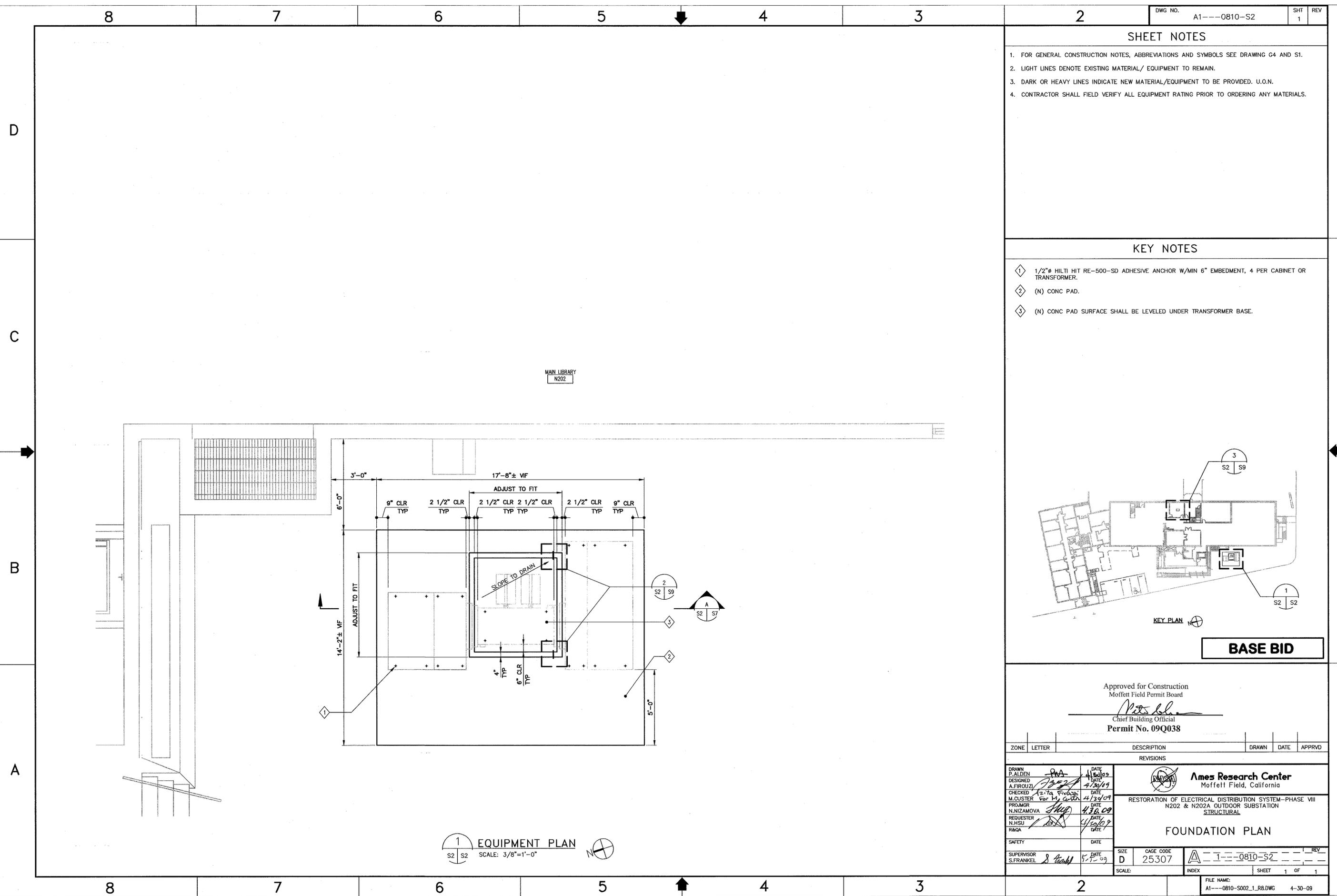
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 DATE: Apr 29, 2009 - 9:26:58 am

SHEET NOTES

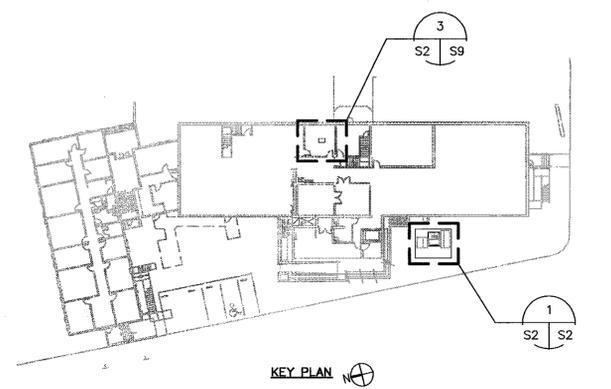
1. FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4 AND S1.
2. LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
3. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
4. CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.

KEY NOTES

- 1 1/2" # HILTI HIT RE-500-SD ADHESIVE ANCHOR W/MIN 6" EMBEDMENT, 4 PER CABINET OR TRANSFORMER.
- 2 (N) CONC PAD.
- 3 (N) CONC PAD SURFACE SHALL BE LEVELED UNDER TRANSFORMER BASE.



MAIN LIBRARY
N202



BASE BID

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Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN P. ALDEN	DATE 4/20/09
DESIGNED A. FIROUZI	DATE 4/20/09
CHECKED M. MUSTER	DATE 4/20/09
PREPARED N. NIZAMOVA	DATE 4/20/09
REQUESTER N. HSU	DATE 4/20/09
R&QA	DATE
SAFETY	DATE

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM—PHASE VIII
N202 & N202A OUTDOOR SUBSTATION
STRUCTURAL

FOUNDATION PLAN

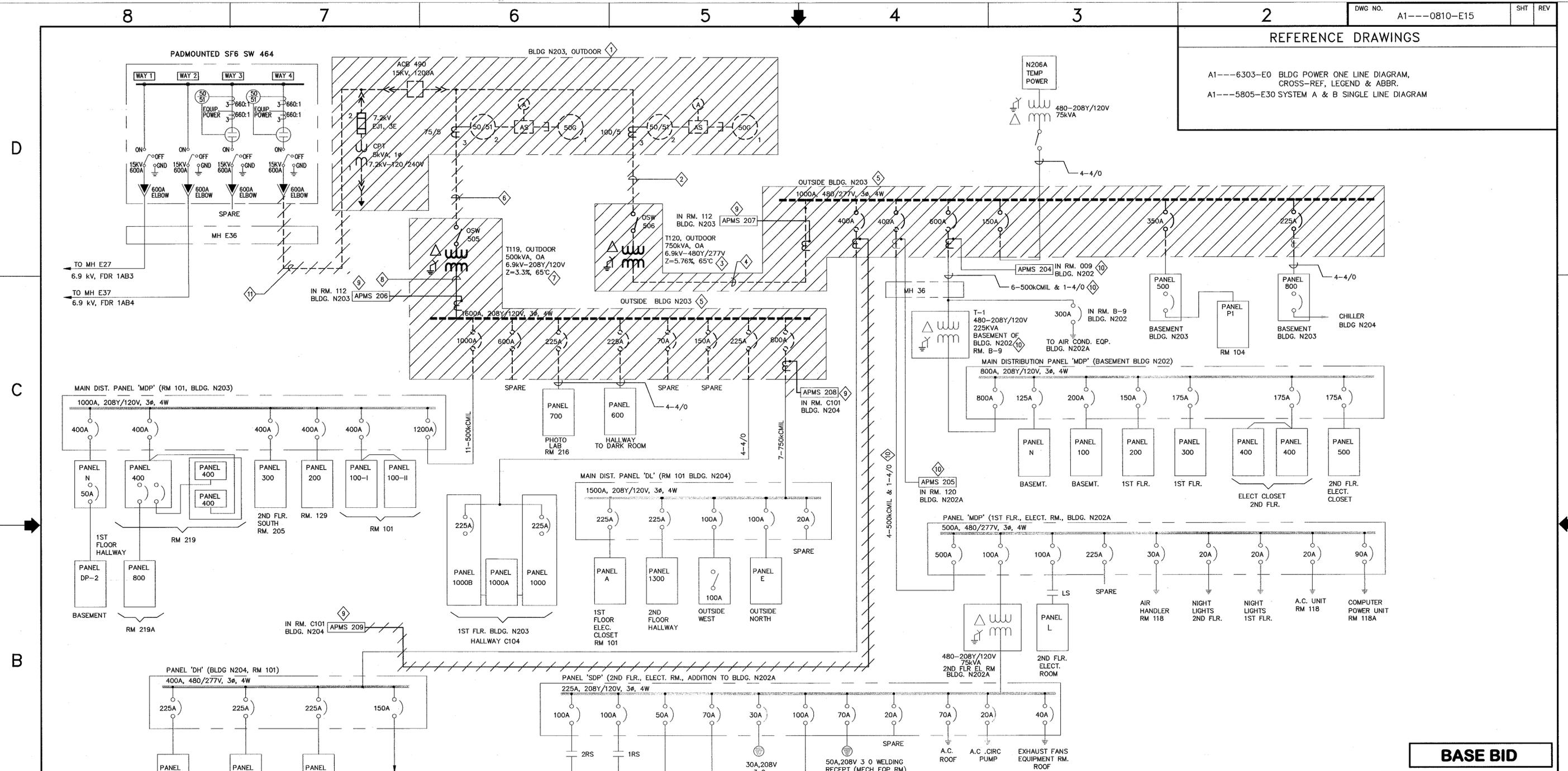
SUPERVISOR S. FRANKEL	DATE 5-1-09	SIZE D	CAGE CODE 25307	INDEX	SHEET 1 OF 1
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1 EQUIPMENT PLAN
SCALE: 3/8"=1'-0"
[North Arrow]

60045720.0001

REFERENCE DRAWINGS

A1---6303-E0 BLDG POWER ONE LINE DIAGRAM, CROSS-REF, LEGEND & ABBR.
 A1---5805-E30 SYSTEM A & B SINGLE LINE DIAGRAM



ONE LINE DIAGRAM-EXISTING/DEMOLITION
 SCALE: NTS

BASE BID

Approved for Construction
 Moffett Field Permit Board
 Chief Building Official
 Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DESIGN	N.NIZAMOVA	DATE	4/29/09		
DESIGNED	N.NIZAMOVA	DATE	4/30/09		
CHECKED	J.McCUSKER	DATE	4/30/09		
PROJECT	N.NIZAMOVA	DATE	4/30/09		
REQUESTER	N.HSU	DATE	4/29/09		
R&A		DATE			
SAFETY		DATE			
SUPERVISOR	S.FRANKEL	DATE	5/15/09		
SIZE	D	CAGE CODE	25307		
SCALE:		INDEX			
FILE NAME: A1---0810-E15_1_RB.DWG 4-30-09					

SHEET NOTES

- FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS, SEE DRAWING G4.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON THE DRAWING.
- SINGLE LINE DIAGRAM IS BASED ON THE LATEST KNOWN EXISTING DRAWINGS.
- HATCHED LINES INDICATE EXISTING MATERIAL AND EQUIPMENT TO BE DEMOLISHED/ REMOVED, U.O.N.
- PRIOR TO SHUTDOWN AND DEMOLITION WORK, CONTRACTOR SHALL PERFORM PHASE SEQUENCE TEST ON EXISTING SYSTEM IN THE PRESENCE OF THE CONTRACTING OFFICER. ALL DISCONNECTED CABLES THAT ARE TO REMAIN SHALL BE PROPERLY IDENTIFIED, TAGGED FOR RESTORATION IN NEW WORK.

KEY NOTES

- REMOVE EXISTING PRIMARY SWITCHGEAR AND CIRCUIT BREAKER ACB490 AND ALL ASSOCIATED EQUIPMENT AND DEVICES.
- REMOVE CONNECTION BETWEEN ACB490 AND TRANSFORMER T120.
- REMOVE EXISTING TRANSFORMER T120 AND ALL ASSOCIATED EQUIPMENT AND DEVICES. SEE DRAWING E5 FOR LAYOUT.
- REMOVE CONNECTION BETWEEN TRANSFORMER T120 AND LV MAIN DISTRIBUTION SWITCHBOARD.
- REMOVE EXISTING LOW VOLTAGE SWITCHBOARD. SEE DRAWING E18 FOR LAYOUT.
- REMOVE CONNECTION BETWEEN ACB490 AND TRANSFORMER T119.

KEY NOTES

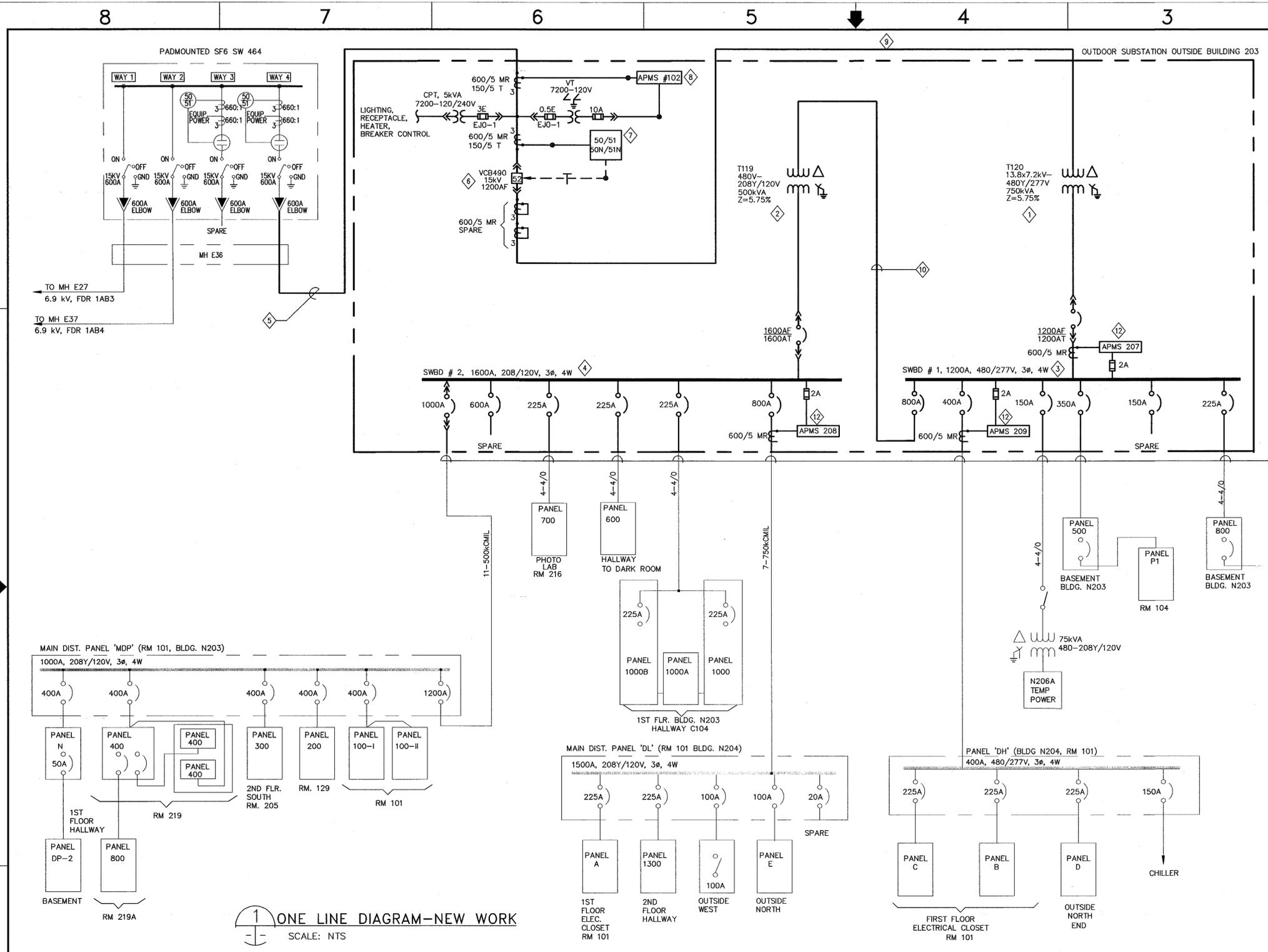
- REMOVE EXISTING TRANSFORMER T119 AND ALL ASSOCIATED EQUIPMENT AND DEVICES. SEE DRAWING E5 FOR LAYOUT.
- REMOVE CONNECTION BETWEEN TRANSFORMER T119 AND LV MAIN DISTRIBUTION SWITCHBOARD.
- DISCONNECT, REMOVE & TURN OVER TO THE GOVERNMENT (E) APMS. REMOVE ALL WIRES UP TO THE COMMUNICATION PANEL. SEE DRAWING E16 FOR NEW WORK.
- SEE DRAWING E2 FOR N202 & N202A DEMOLITION WORK.
- DISCONNECT AND REMOVE (E) 3-1/C-350KCMIL 6.9KV VCL CABLES FROM SW 464 TO ACB 490.

DWG: \\F:\19-m3\cadd\ARC\REDS\REDS Phase VII\500_CAD\N203_Outdoor Substation Upgrade - T119 and T120\EA\Sheet\A1---0810-E15_1_RB.dwg User: polten
 DATE: Apr 29, 2009 - 9:21:03 am

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SHEET NOTES

- FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4.
- SINGLE LINE DIAGRAM IS BASED ON THE LATEST KNOWN EXISTING NASA DRAWING.
- LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON DWG.
- DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- THE DIAGRAM IS PROVIDED FOR GUIDANCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT INCLUDING TERMINAL BLOCKS, TERMINAL IDENTIFICATION NUMBER, CONNECTIONS ETC. AND REVISE DRAWINGS AS NEEDED TO MATCH EXISTING AND NEW EQUIPMENT TO PROVIDE A COMPLETE FUNCTIONAL SYSTEM.
- ALL CT WIRES SHALL BE #10 AWG MINIMUM, TYPE SIS.
- ALL VOLTAGE, CPT SECONDARY AND BREAKER TRIP WIRES SHALL BE #12 AWG MINIMUM, TYPE SIS. U.O.N.
- CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.
- CPT AND VT'S SHALL BE DRAWOUT TYPE.
- SEE DRAWING E22 FOR THREE LINE DIAGRAM AND E23 FOR BREAKER CONTROL DIAGRAM. SEE DRAWING E80 FOR NAMEPLATE SCHEDULE.



ONE LINE DIAGRAM-NEW WORK
SCALE: NTS

BASE BID

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	N. NIZAMOVA	DATE	4/28/09
DESIGNED	N. NIZAMOVA	DATE	4/30/09
CHECKED	J. MCCUSKER	DATE	4/30/09
PROJECT	N. NIZAMOVA	DATE	4/30/09
REQUESTER	N. HSU	DATE	9/20/09
R&A		DATE	
SAFETY		DATE	
SUPERVISOR	S. FRANKEL	DATE	5-7-09

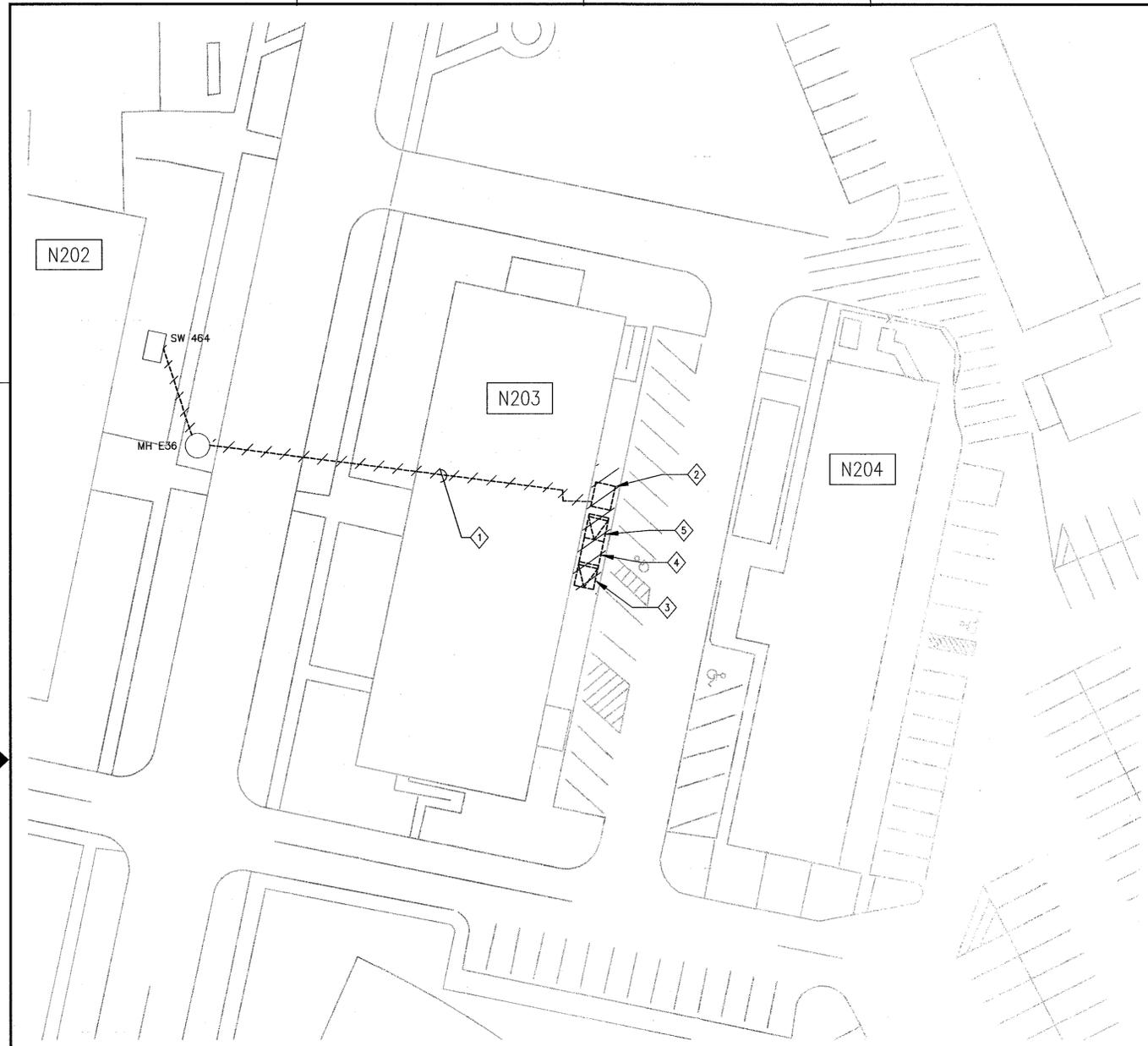
Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N203 & N204 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

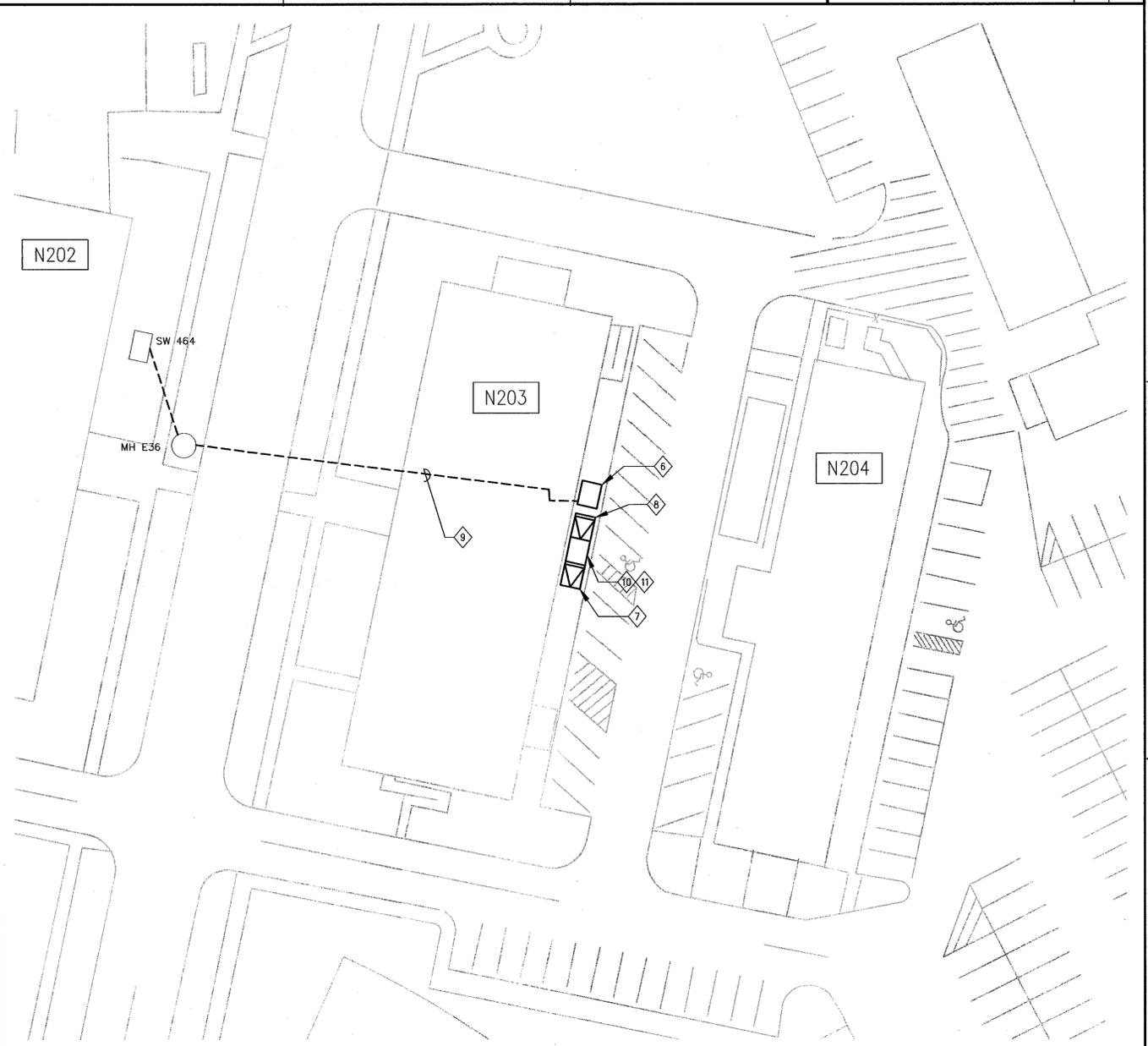
**ONE LINE DIAGRAM
NEW WORK**

SIZE	CAGE CODE	REV
D	25307	1
SCALE:	INDEX	SHEET 1 OF 1

DWG: \\f19-m3\cadd\ARC\REDS\Phase VIII\500_CAD\N203_Outdoor Substation Upgrade - T119 and T120\Sheet\A1---0810-E016_1.R8.dwg User: pdaten
 DATE: Apr 28, 2009 - 9:21:07 am



A SITE PLAN - DEMOLITION
SCALE: 1"=300'



B SITE PLAN - NEW WORK
SCALE: 1"=300'

BASE BID

SHEET NOTES

- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON THE DRAWING.
- HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED, U.O.N.
- CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS AT THE SITE AND SHALL BE RESPONSIBLE FOR THEIR ACCURACY PRIOR TO STARTING ANY WORK OR ORDERING ANY MATERIAL.

KEY NOTES

- 1 DISCONNECT AND REMOVE (E) 3-1/C-350kCMIL 6.9kV CABLES FROM SW 464 TO ACB 490.
- 2 REMOVE EXISTING PRIMARY SWITCHGEAR AND CIRCUIT BREAKER ACB490 AND ALL ASSOCIATED EQUIPMENT AND DEVICES.
- 3 REMOVE EXISTING TRANSFORMER T120 AND ALL ASSOCIATED EQUIPMENT AND DEVICES. SEE DRAWING E18 FOR LAYOUT.
- 4 REMOVE EXISTING LOW VOLTAGE SWITCHBOARDS. DISCONNECT ALL WIRES, TAG AND SAVE FOR RECONNECTION IN NEW WORK. SEE DRAWING E18 FOR EXISTING/DEMOLITION AND DRAWING E19 FOR NEW LAYOUT.
- 5 REMOVE EXISTING TRANSFORMER T119 AND ALL ASSOCIATED EQUIPMENT AND DEVICES. SEE DRAWING E18 FOR LAYOUT.
- 6 PROVIDE NEW 15kV, 1200A SWITCHGEAR WITH VACUUM CIRCUIT BREAKER VCB490, CPT, VT AND ALL ACCESSORIES PER SPECIFICATION SECTION 26 13 00.00 20.
- 7 PROVIDE NEW OUTDOOR LIQUID-FILLED 750kVA TRANSFORMER T120 WITH DUAL RATED PRIMARY WINDING, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- 8 PROVIDE NEW OUTDOOR LIQUID-FILLED 500kVA 480-208Y/120V TRANSFORMER T119, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.

- 9 PROVIDE 15kV, 3-1/C 350kCMIL, 133% INSULATION, EPR CABLE AND 1 # 4 GND FROM SW 464 TO VCB 490 IN (E) 4" CONDUITS.
- 10 PROVIDE NEW OUTDOOR 480Y/277V 1200A SWITCHBOARD SWBD #1 WITH DRAW OUT MAIN CIRCUIT BREAKER WITH GFP AND MOLDED CASE FEEDER CIRCUIT BREAKERS. SEE DRAWING E16 FOR ONE LINE DIAGRAM.
- 11 PROVIDE NEW OUTDOOR 208Y/120V 1600A SWITCHBOARD SWBD #2 WITH DRAW OUT MAIN CIRCUIT BREAKER WITH GFP AND MOLDED CASE FEEDER CIRCUIT BREAKERS. SEE DRAWING E16 FOR ONE LINE DIAGRAM.

Approved for Construction
Moffett Field Permit Board
Nitz Nizamova
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DESIGNED N. NIZAMOVA	DATE 4.30.09
CHECKED J. McCUSKER	DATE 4.30.09
PROJMgr N. NIZAMOVA	DATE 4.30.09
REQUESTER N. HSU	DATE 4.30.09
R&Q	DATE 4.30.09
SAFETY	DATE
SUPERVISOR S. FRANKEL	DATE 5-9-09

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N203 & N204 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

**SITE PLANS
DEMOLITION & NEW WORK**

SIZE D	CAGE CODE 25307	SCALE 1"=300'	INDEX	SHEET 1 OF 1
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DWG: \\F:\119-113\cadd\ARC\REDS\REDS Phase VII\500_CAD\N203_Outdoor Substation Upgrade - T119 and T120\Sheet\A1---0810-E17_L_R8.dwg User: pdalen
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DWG NO. A1---0810-E18

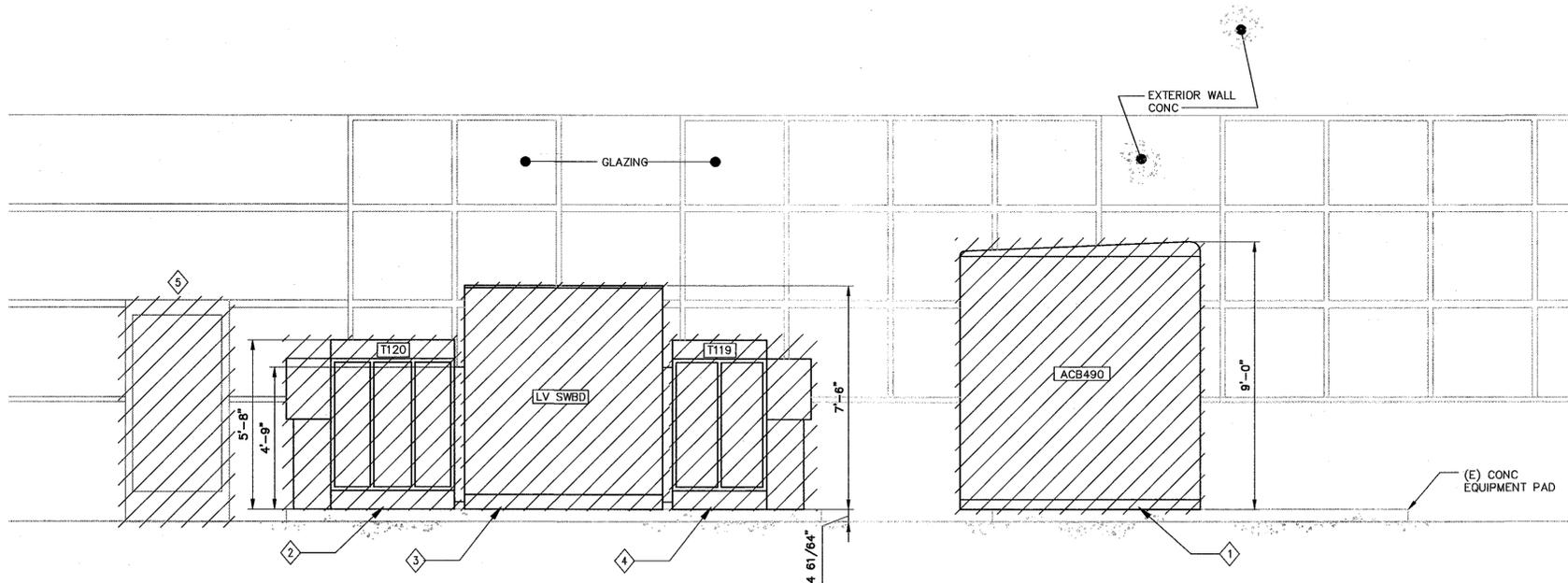
SHT 1 REV

SHEET NOTES

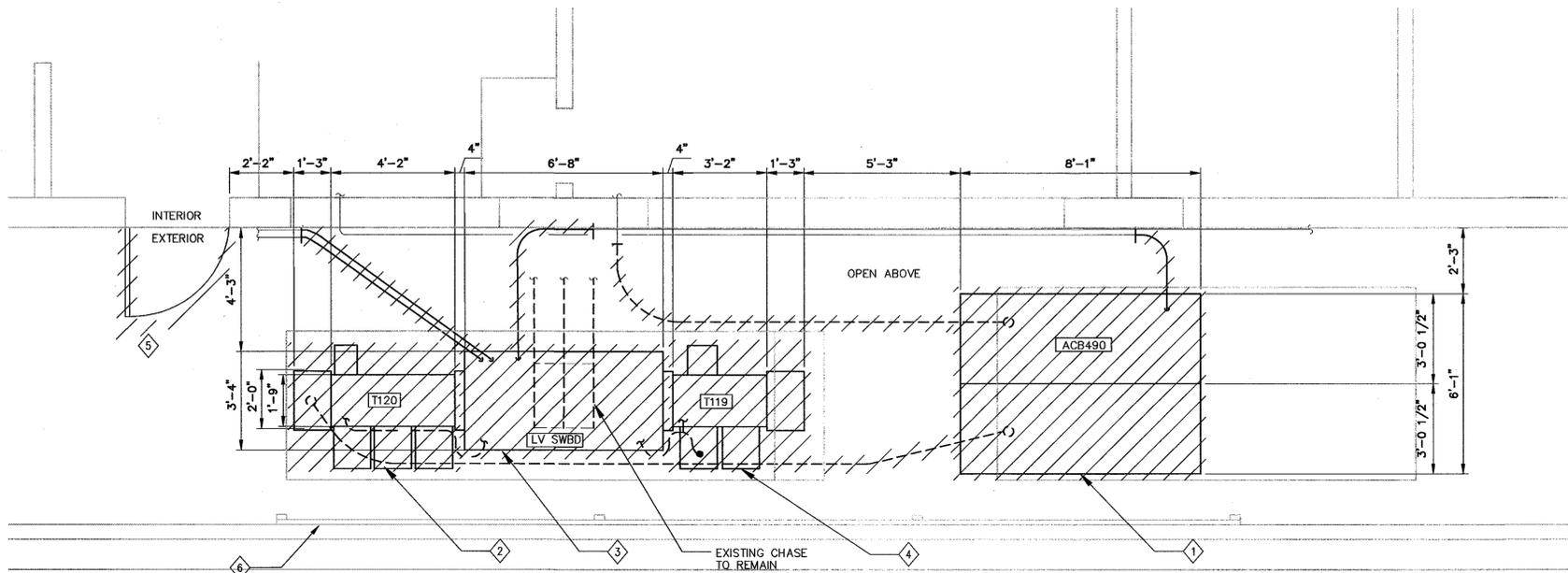
- FOR GENERAL CONSTRUCTION NOTES, SYMBOLS AND ABBREVIATIONS SEE DRAWING G4.
- HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED U.O.N.
- ALL EXISTING CONDUITS AND CONDUCTORS SHALL BE DISCONNECTED FROM (E) EQUIPMENT AND RECONNECTED TO NEW EQUIPMENT. CONTRACTOR SHALL DETERMINE IN FIELD AND PROVIDE PULL BOXES AND RELOCATE/EXTEND OR REPLACE (E) CONDUITS AND CONDUCTORS (MATCH EXISTING SIZE) TO COMPLETE CONNECTIONS TO NEW AND EXISTING EQUIPMENT.
- EXISTING GROUNDING SYSTEM TO REMAIN FOR RECONNECTION IN NEW WORK.
- PRIOR TO SHUTDOWN AND DEMOLITION WORK, CONTRACTOR SHALL PERFORM PHASE SEQUENCE TEST ON EXISTING SYSTEM/EQUIPMENT IN THE PRESENCE OF COTR.

KEY NOTES

- REMOVE EXISTING PRIMARY SWITCHGEAR AND CIRCUIT BREAKER ACB490 AND ALL ASSOCIATED EQUIPMENT AND DEVICES.
- REMOVE EXISTING TRANSFORMER T120 AND ALL ASSOCIATED EQUIPMENT AND DEVICES. SEE DRAWING E15 FOR ONE LINE DIAGRAM.
- REMOVE EXISTING LOW VOLTAGE SWITCHBOARD. DISCONNECT ALL WIRES, TAG AND SAVE FOR RECONNECTION IN NEW WORK. SEE DRAWING E15 FOR ONE LINE DIAGRAM.
- REMOVE EXISTING TRANSFORMER T119 AND ALL ASSOCIATED EQUIPMENT AND DEVICES. SEE DRAWING E15 FOR ONE LINE DIAGRAM.
- REMOVE EXISTING STOREFRONT DOOR, FRAME AND HARDWARE. SEE DRAWING E19 FOR NEW DOOR DESCRIPTION.
- EXISTING GUARDRAIL, SEE STRUCTURAL DRAWING FOR DETAILS.



A EQUIPMENT ELEVATION-DEMOLITION
SCALE: 3/8"=1'-0"



1 EQUIPMENT PLAN - DEMOLITION
SCALE: 3/8"=1'-0"

BASE BID

Approved for Construction
Moffett Field Permit Board
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD

REVISIONS

NO.	DATE	DESCRIPTION
1	4.30.09	DESIGNED
2	4.30.09	CHECKED
3	4.30.09	PROJWGR
4	4.30.09	REQUESTER
5	4.30.09	R&QA
6	4.30.09	SUPERVISOR

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N203 & N204 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

EQUIPMENT PLAN AND ELEVATION
EXISTING/DEMOLITION

SIZE D	CAGE CODE 25307	INDEX	SHEET 1 OF 1
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FILE NAME:
A1---0810-E018_1_RB.DWG 4-30-09

DWG: \\F119-m3\cadd\ARC\REDS\REDS Phase VII\500_CAD\N203_Outdoor Substation Upgrade - T119 and T120\A1---0810-E018_1_RB.dwg Version: 17.1s (LMS Tech) User: pdtten DATE: Apr 29, 2009 - 9:21:21 am

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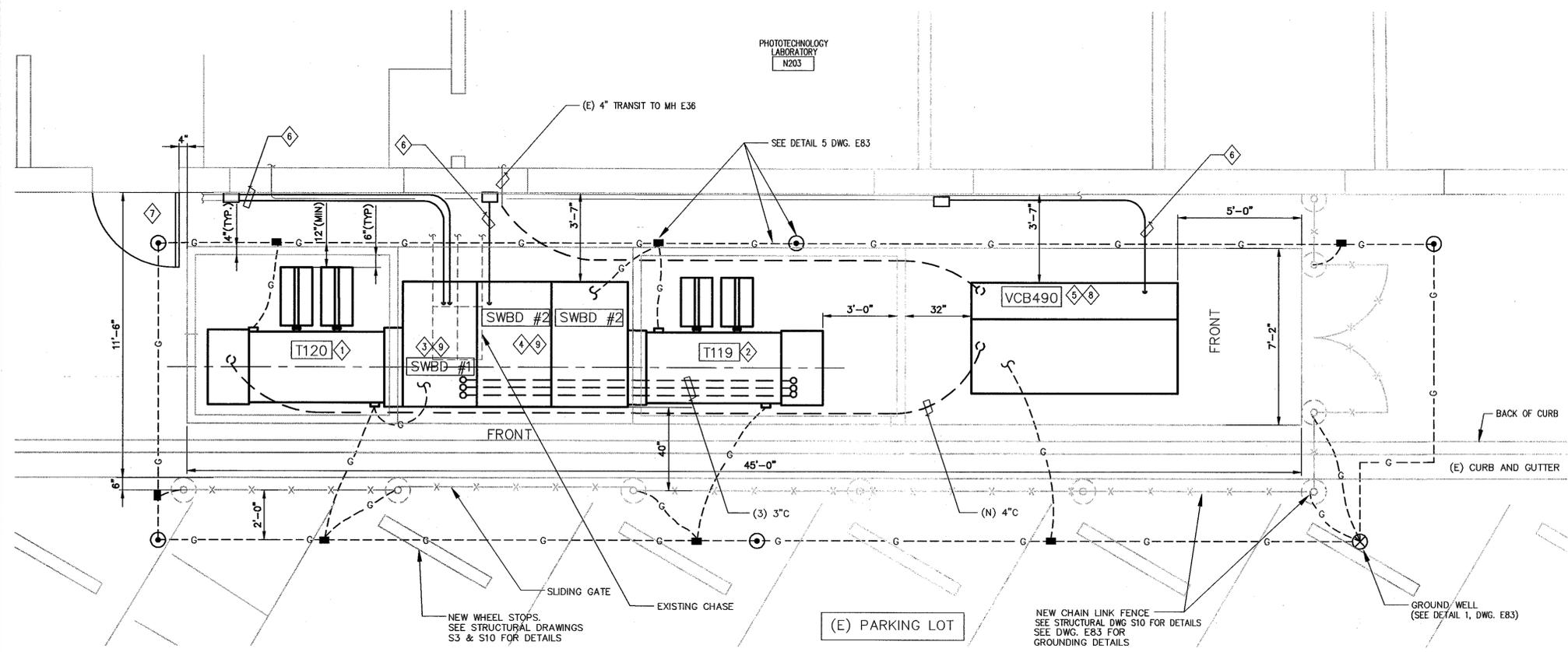
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SHEET NOTES

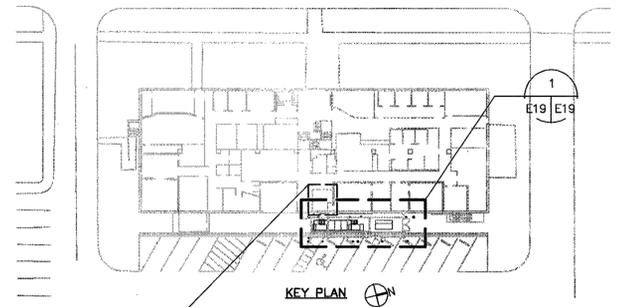
- FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4.
- LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
- DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.
- ALL EXISTING CONDUITS AND CONDUCTORS SHALL BE RECONNECTED TO NEW EQUIPMENT. CONTRACTOR SHALL DETERMINE IN FIELD AND PROVIDE PULL BOXES AND RELOCATE/EXTEND OR REPLACE (E) CONDUITS AND CONDUCTORS (MATCH EXISTING SIZE) TO COMPLETE CONNECTIONS TO NEW AND EXISTING EQUIPMENT.
- SEE STRUCTURAL DRAWINGS S3, S7 & S9 FOR CONCRETE PAD DETAILS.

KEY NOTES

- PROVIDE NEW OUTDOOR LIQUID-FILLED 750kVA TRANSFORMER T120 WITH DUAL RATED PRIMARY WINDING, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- PROVIDE NEW OUTDOOR LIQUID-FILLED 500kVA 480-208Y/120V TRANSFORMER T119, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- PROVIDE NEW OUTDOOR 480Y/277V 1200A SWITCHBOARD SWBD #1 WITH DRAW OUT MAIN CIRCUIT BREAKER WITH GFP AND MOLDED CASE FEEDER CIRCUIT BREAKERS. INSTALL NEW SWITCHBOARD ON 12" C-CHANNEL BASE.
- PROVIDE NEW OUTDOOR 208Y/120V 1600A SWITCHBOARD SWBD #2 WITH DRAW OUT MAIN CIRCUIT BREAKER WITH GFP AND MOLDED CASE FEEDER CIRCUIT BREAKERS. INSTALL NEW SWITCHBOARD ON 12" C-CHANNEL BASE.
- PROVIDE 15kV, 1200A VACUUM CIRCUIT BREAKER SWITCHGEAR VCB490 INCLUDING CPT, VT AND ALL ACCESSORIES PER SPECIFICATION SECTION 26 13 00.00 20.
- PROVIDE NEW CONDUIT AND CONDUCTORS (TO MATCH EXISTING) FROM SWITCHGEAR TO NEW WALL MOUNTED JUNCTION BOX AND CONNECT TO EXISTING CONDUIT AND CONDUCTORS.
- PROVIDE AND INSTALL ALUMINUM STOREFRONT DOOR TO MATCH (E) 3'-0"x7'-0" DOOR SIZE (FIELD VERIFY) WITH 10" KICKPLATE, ALUMINUM FRAME AND HARDWARE. HARDWARE SHALL INCLUDE DOOR CLOSURE, DOOR SEALS, PANIC HARDWARE. MODIFY/RELOCATE DOOR CONTACTS, WIRING FOR FUTURE DOOR OPENER, CARD READER, DOOR BUZZER AND DOOR STOP. DOOR THRESHOLD SHALL NOT EXCEED 1/2" AFF. DOOR, FRAME AND HARDWARE SHALL CONFORM TO SECTIONS 1008 AND 1133B.2 OF THE 2007 CALIFORNIA BUILDING CODE.
- PROVIDE 3/4" CONDUIT WITH CAT 5E ETHERNET CABLES FROM APMS #102 IN MV SWITCHGEAR TO COMMUNICATION PANEL IN ROOM # 130. INSTALL CONDUIT NOT MORE THAN 5 FEET FROM THE PANEL. PROVIDE ADDITIONAL 25 FEET OF CABLE AND RJ-45 CONNECTORS AT EACH END. ETHERNET CABLE HOOK UP TO COMMUNICATION PANEL AND APMS WILL BE PERFORMED BY OTHERS. APPROXIMATE DISTANCE FROM MV SWGR TO COMMUNICATION PANEL IS 70 FEET. SEE KEY PLAN ON THIS DRAWING FOR COMMUNICATION ROOM LOCATION.
- PROVIDE 1" CONDUIT WITH (3) CAT 5E ETHERNET CABLES, ONE FROM EACH APMS IN LV SWITCHBOARDS (APMS #208, APMS #207 & APMS #209) TO COMMUNICATION PANEL IN ROOM # 130. INSTALL CONDUIT NOT MORE THAN 5 FEET FROM THE PANEL. PROVIDE ADDITIONAL 25 FEET OF CABLE AND RJ-45 CONNECTORS AT EACH END. ETHERNET CABLE HOOK UP TO COMMUNICATION PANEL AND APMS WILL BE PERFORMED BY OTHERS. APPROXIMATE DISTANCE FROM LV SWBDS TO COMMUNICATION PANEL IS 40 FEET. SEE KEY PLAN ON THIS DRAWING FOR COMMUNICATION ROOM LOCATION.



1 EQUIPMENT PLAN - NEW WORK
 E19 | E19 SCALE: 3/8"=1'-0"



BASE BID

Approved for Construction
 Moffett Field Permit Board

 Chief Building Official
 Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	N.NIZAMOVA	DATE	4.30.09
DESIGNED	N.NIZAMOVA	DATE	4.30.09
CHECKED	J.MCCUSKER	DATE	4.30.09
PREPARED	N.NIZAMOVA	DATE	4.30.09
REQUESTER	N.HSU	DATE	4.30.09
R&QA		DATE	
SAFETY		DATE	
SUPERVISOR	S.FRANKEL	DATE	5-22-09

Ames Research Center
 Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
 N203 & N204 OUTDOOR SUBSTATION UPGRADE
 ELECTRICAL

EQUIPMENT PLAN
NEW WORK

SIZE	D	CAGE CODE	25307	REV	
SCALE:	INDEX	SHEET	1	OF	1

FILE NAME: A1---0810-E19_1.R8.DWG 4-30-09

DWG: \\fer19-m3\cadd\ARC\REDS\REDS Phase VIII\300_CAD\200_Outdoor Substation Upgrade - T119 and T120\Sheet\A1---0810-E19_1.R8.dwg User: pdallen Version: 17.1s (LWG Tech) DATE: Apr 29, 2009 - 9:21:29 am

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DWG NO. A1---0810-E20

SHT REV

SHEET NOTES

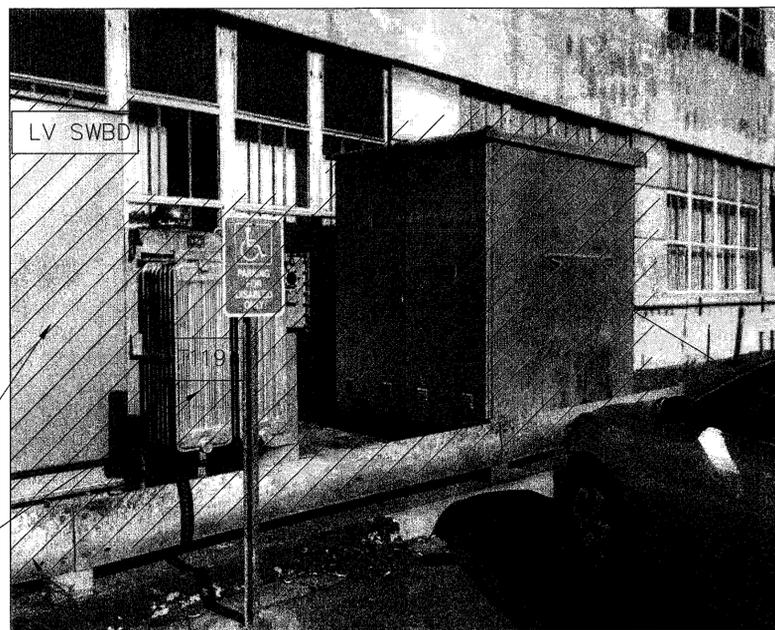
- 1. HATCHED LINES INDICATE EXISTING MATERIALS AND EQUIPMENT TO BE DEMOLISHED AND REMOVED.
- 2. SEE DRAWING E18 FOR EQUIPMENT LAYOUT-EXISTING/DEMOLITION.

KEY NOTES

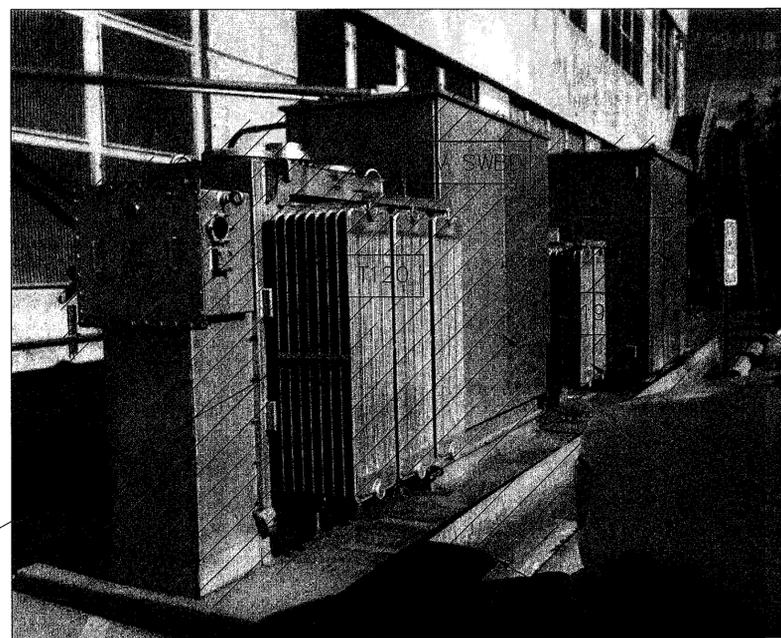
- 1 REMOVE EXISTING TRANSFORMER T119 AND ALL ASSOCIATED EQUIPMENT AND DEVICES, SEE DRAWING E18 FOR LAYOUT AND DRAWING E15 FOR ONE LINE DIAGRAM.
- 2 REMOVE EXISTING TRANSFORMER T120 AND ALL ASSOCIATED EQUIPMENT AND DEVICES, SEE DRAWING E18 FOR LAYOUT AND DRAWING E15 FOR ONE LINE DIAGRAM.
- 3 REMOVE EXISTING LOW VOLTAGE DISTRIBUTION SWITCHBOARD.
- 4 REMOVE EXISTING 15kV CIRCUIT BREAKER SWITCHGEAR ACB503 AND ALL ASSOCIATED EQUIPMENT AND DEVICES.
- 5 EXISTING GUARDRAIL SHALL BE REMOVED. SEE STRUCTURAL DRAWINGS FOR DETAILS. SEE DRAWINGS E18 & E19 FOR EXISTING AND NEW EQUIPMENT LAYOUTS.



1 (E) N203 SUBSTATION DETAIL
18 20 SCALE:



2 (E) N203 SUBSTATION DETAIL
18 20 SCALE:



3 (E) N203 SUBSTATION DETAIL
18 20 SCALE:

BASE BID

Approved for Construction
Moffett Field Permit Board
Mike Dolan
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN N.NIZAMOVA DESIGNED N.NIZAMOVA CHECKED J.MCCLUSKER PRG.MGR N.NIZAMOVA REQUESTER N.HSU R&QA	DATE 4.30.09 DATE 4.30.09 DATE 4.30.09 DATE 4.30.09 DATE 4.30.09	 Ames Research Center Moffett Field, California RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII N203 & N204 OUTDOOR SUBSTATION UPGRADE ELECTRICAL	PHOTO DETAILS EXISTING/DEMOLITION
SAFETY DATE SUPERVISOR S.FRANKEL DATE 5-7-09	SIZE D SCALE:	CAGE CODE 25307 INDEX	SHEET OF FILE NAME: A1---0810-E020_1_RB.DWG 4-30-09

DWG: \\F6119-n13\ccad\ARC\REDS\REDS Phase VII\500_CAD\N203_Outdoor Substation Upgrade - T119 and T120\Sheet\A1---0810-E020_1_RB.dwg Version: 17.1s (LMS Tech) User: pdalen DATE: Apr 29, 2009 - 9:21:36 am

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DWG NO. A1---0810-E21 SHT REV

SHEET NOTES

- 1. NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON DWG.
- 2. HATCHED LINES INDICATE EXISTING MATERIALS AND EQUIPMENT TO BE DEMOLISHED AND REMOVED.
- 3. THE DIAGRAM IS PROVIDED FOR GUIDANCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT INCLUDING TERMINAL BLOCKS, TERMINAL IDENTIFICATION NUMBER, CONNECTIONS ETC. AND REVISE DRAWINGS AS NEEDED TO MATCH EXISTING AND NEW EQUIPMENT TO PROVIDE A COMPLETE FUNCTIONAL SYSTEM.

KEY NOTES

- DISCONNECT AND REMOVE EXISTING ACB490 SWITCHGEAR AND ALL ASSOCIATED DEVICES AND ACCESSORIES.

BASE BID

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	N.NIZAMOVA	DATE	4/30/09
DESIGNED	N.NIZAMOVA	DATE	4/30/09
CHECKED	J.MCCUSKER	DATE	4/30/09
PREPARED	N.NIZAMOVA	DATE	4/30/09
REQUESTER	N.HSU	DATE	4/30/09
R&QA		DATE	

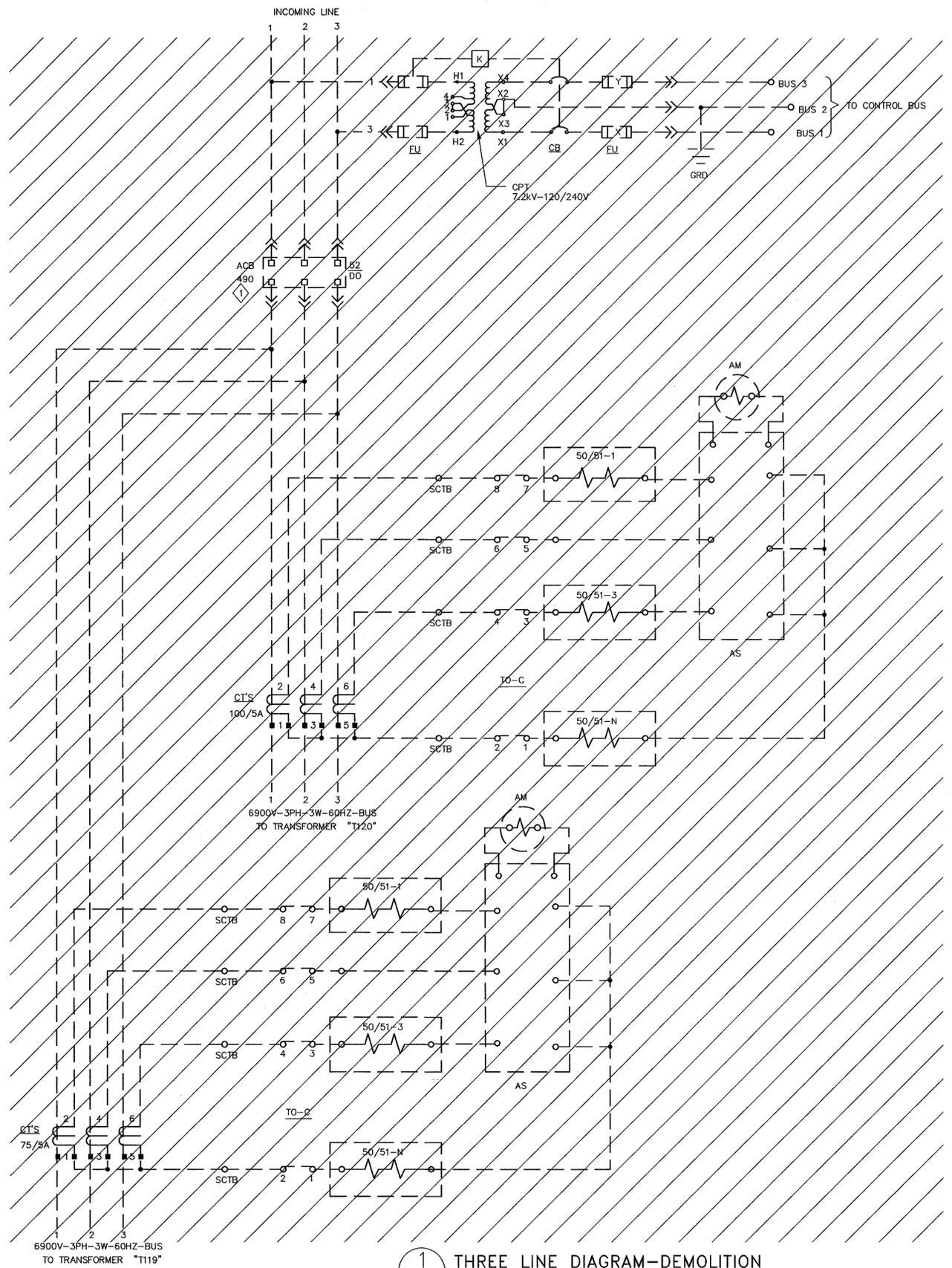
Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N203 & N204 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

THREE LINE DIAGRAM DEMOLITION

SUPervisor	S.FRANKEL	DATE	5-9-09
Safety		DATE	

SIZE	D	CAGE CODE	25307
SCALE		INDEX	
FILE NAME	A1---0810-E021_1_R8.DWG		
		SHEET	4-30-09



1 THREE LINE DIAGRAM-DEMOLITION
SCALE: N.T.S.

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FILE NAME: A1---0810-E021_1_R8.DWG 4-30-09

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 Version: 17.1s (LMS Tech) User: pdolan
 DATE: Apr 29, 2009 10:52:42 am

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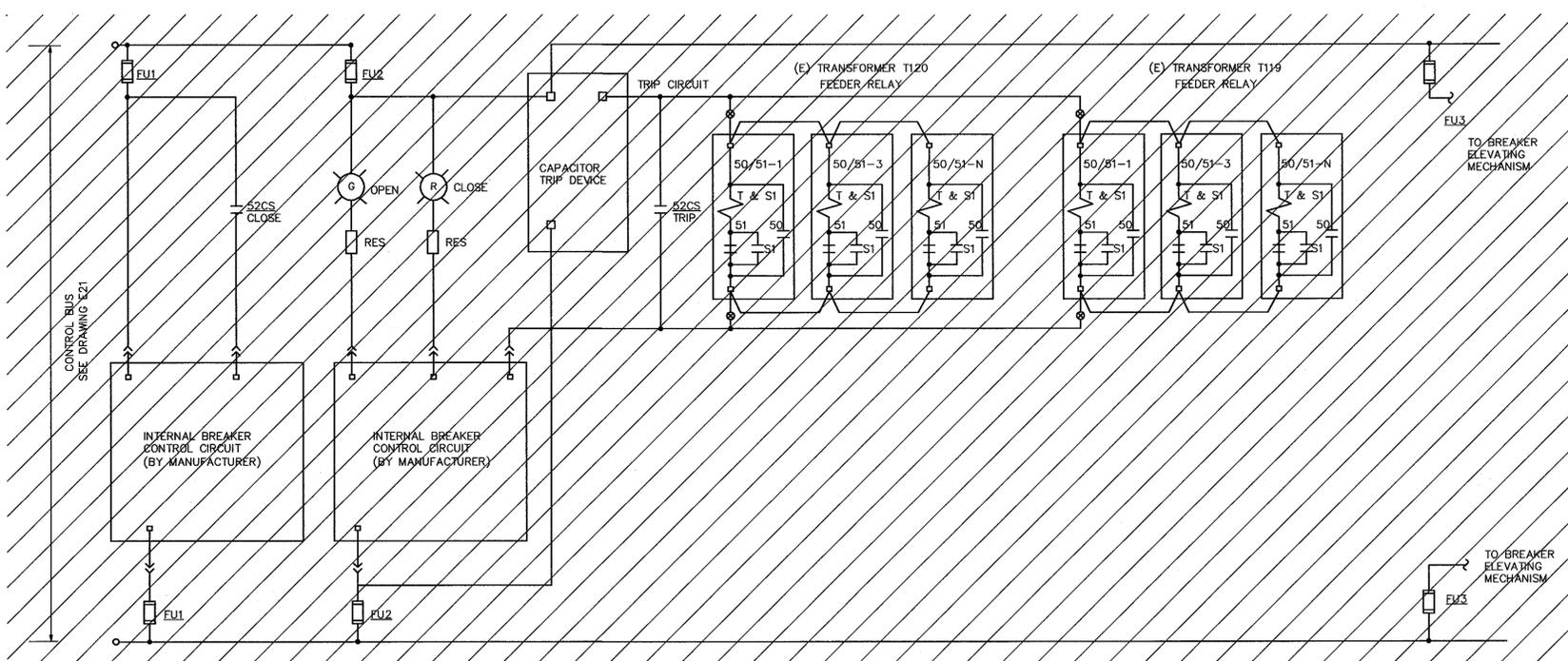
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SHEET NOTES

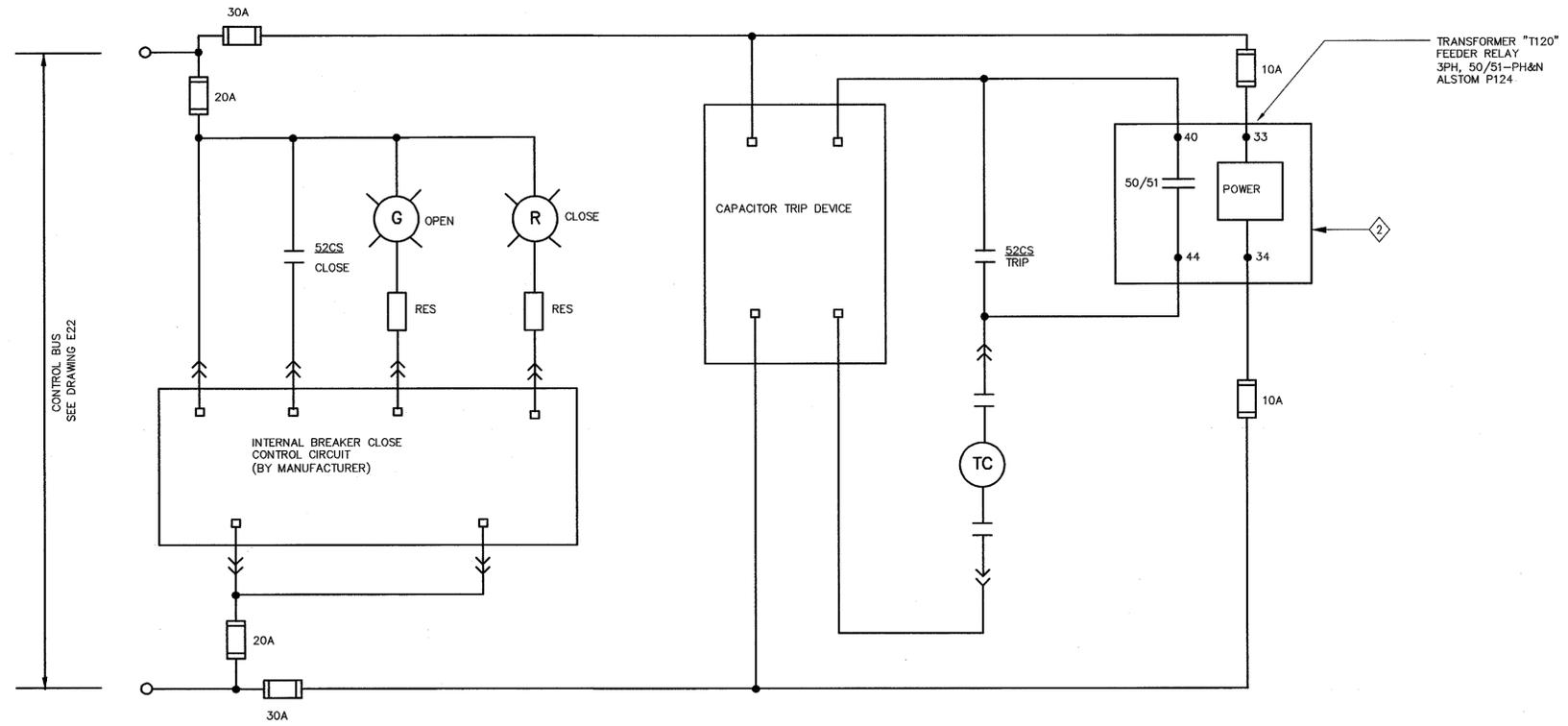
- HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED. U.O.N.
- DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- THE DIAGRAMS ARE PROVIDED FOR GUIDANCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT INCLUDING TERMINAL BLOCKS, TERMINAL IDENTIFICATION NUMBER, CONNECTIONS ETC. AND REVISE DRAWINGS AS NEEDED TO MATCH EXISTING AND NEW EQUIPMENT TO PROVIDE A COMPLETE FUNCTIONAL SYSTEM.
- THE CONTROL DIAGRAMS ARE BASED ON THE LATEST KNOWN EXISTING DRAWINGS.
- NEW TERMINAL MARKINGS ARE BASED ON CUTLER HAMMER INFORMATION.

KEY NOTES

- DISCONNECT AND REMOVE EXISTING ACB490 SWITCHGEAR INCLUDING ALL ASSOCIATED DEVICES AND ACCESSORIES.
- EINSTALL NEW GFE 3-PHASE MICROPROCESSOR BASED RELAY, ALSTOM MICOM P124, COMPLETELY WIRED INTO THE NEW EQUIPMENT.
- TYPICAL BREAKER CONTROL DIAGRAM WITH THE RELATED TRANSFORMER FEEDER RELAYS. FOR SUBSTATION ONE LINE DIAGRAMS AND THREE LINE DIAGRAMS, REFER TO THE DRAWINGS E16 AND E22 RESPECTIVELY.



1 VCB490 BREAKER CONTROL DIAGRAM - DEMOLITION
SCALE: NTS



2 VCB490 BREAKER CONTROL DIAGRAM - NEW WORK
SCALE: NTS

BASE BID

Approved for Construction
Moffett Field Permit Board
Mark S. ...
Chief Building Official
Permit No. 09Q038

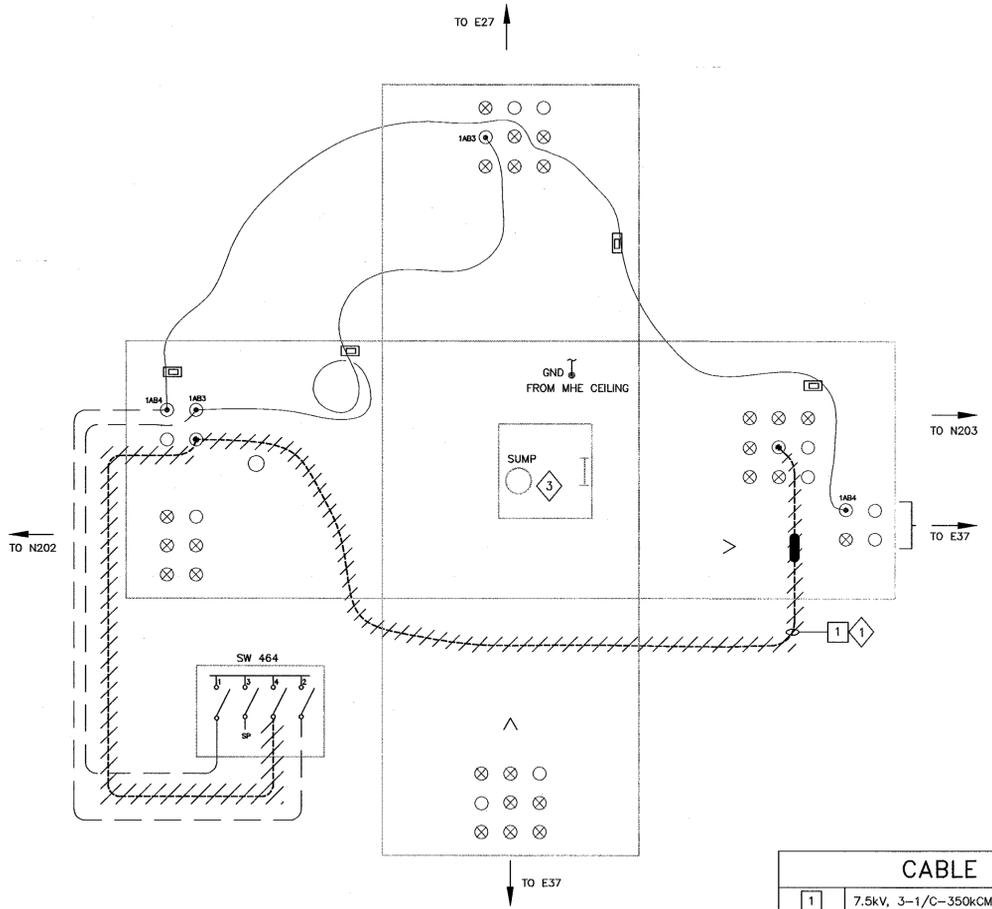
ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN N.NIZAMOVA	DATE 4/30/09
DESIGNED N.NIZAMOVA	DATE 4/30/09
CHECKED J.MACUSKER	DATE 4/30/09
PROJ.MGR N.NIZAMOVA	DATE 4/30/09
REQUESTER N.HSU	DATE 4/12/09
R&QA	
SAFETY	DATE
SUPERVISOR S.FRANKEL	DATE 4-30-09

Ames Research Center Moffett Field, California	
RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII N203 & N204 OUTDOOR SUBSTATION UPGRADE ELECTRICAL	
VCB490 BREAKER CONTROL DIAGRAMS-DEMOLITION & NEW WORK	
SIZE D	CAGE CODE 25307
SCALE:	INDEX
FILE NAME: A1---0810-E023_1_R8.DWG	SHEET 1 OF 1

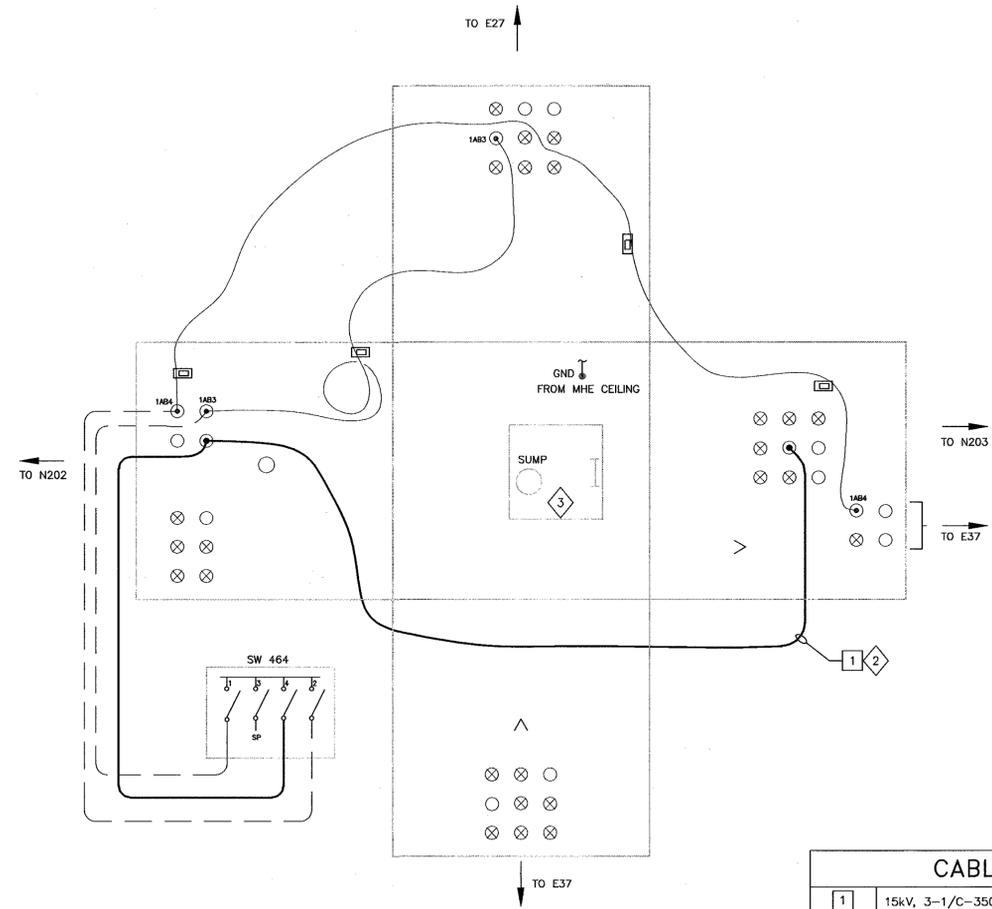
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 DATE: Apr 29, 2009 9:21:46 am Version: 17.1s (JMS Tech)

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CABLE DESCRIPTION	
1	7.5kV, 3-1/C-350kCMIL CABLE

1 MANHOLE NO. E36 DETAIL - EXISTING/DEMOLITION
SCALE: NTS (De France Ave. East OF N202)



CABLE DESCRIPTION	
1	15kV, 3-1/C-350 kCMIL, 133%INS., EPR CABLE & 1/C # 4 GND

2 MANHOLE NO. E36 DETAIL - NEW WORK
SCALE: NTS (De France Ave. East OF N202)

BASE BID

SHEET NOTES

- SHEET NOTES #1,2,3 ARE NOT PART OF THIS CONTRACT (THE INTENTION IS FOR NASA 'IN-HOUSE' USE).
- THIS DRAWING IS NOT THE CONTROLLED NASA AMES CONFIGURATION MANAGEMENT BASELINE DRAWING.
- THE AMES CONFIGURATION MANAGEMENT BASELINE DRAWING THAT WAS USED TO CREATE THE PROJECT DRAWING IS A1---9801-E36.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON DRAWING.
- HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED, U.O.N.
- CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS AT THE SITE AND SHALL BE RESPONSIBLE FOR THEIR ACCURACY PRIOR TO STARTING ANY WORK OR ORDERING ANY MATERIAL.
- UPON COMPLETION OF CABLE WORK AND PRIOR ENERGIZATION, CONTRACTOR SHALL INFORM GOVERNMENT FOR TAKING AS-BUILT PHOTOS AND UPDATING OF NASA REFERENCE DWG.
- FOR N203 OUTDOOR SUBSTATION SITE PLAN - EXISTING/DEMO AND NEW WORK SEE DRAWING E17.
- LIGHT LINES INDICATE EXISTING CONDITION AND DARK LINES INDICATE NEW WORK.
- NEW CABLE ROUTING INSIDE THE MANHOLE IS SHOWN DIAGRAMMATICALLY. EXACT CABLE ROUTING INSIDE MANHOLE SHALL BE IN ACCORDANCE WITH DWG E86.

KEY NOTES

- DISCONNECT AND REMOVE EXISTING CABLE FROM SW 464 TO N203 SUBSTATION VCB 490 SWITCHGEAR VIA MH E36.
- PROVIDE 15kV, 3-1/C-350kCMIL, 133 % INS., EPR CABLE AND 1/C # 4 GND TO VCB 490. INSTALL FEEDER IDENTIFICATION TAG & PHASE IDENTIFICATION COLOR TAPE.
- MANHOLE OPENING SIZE: 42" x 42" x 27" DEEP.
- ALL INFORMATION INCLUDED IN THIS DETAIL IS CONSIDERED AS EXISTING CONDITIONS BASED ON LATEST KNOWN EXISTING DRAWINGS.

NASA REFERENCE DRAWINGS

A1---9801-E36 UNDERGROUND POWER DISTRIBUTION MANHOLE E36 DETAIL.

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Moffett Field Permit Board
Met blum
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	N.NIZAMOVA	DATE	4/30/09
DESIGNED	N.NIZAMOVA	DATE	4/30/09
CHECKED	J.MCCUSKER	DATE	4/30/09
PROJECTOR	N.NIZAMOVA	DATE	4/30/09
REQUESTER	N.HSU	DATE	9/30/08
R&QA		DATE	

Ames Research Center
Moffett Field, California
RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N203 & N204 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

**MHE36 DETAILS
EXISTING/DEMOLITION & NEW WORK**

SUPERVISOR	S.FRANKEL	DATE	9/2/09	SIZE	D	CAGE CODE	25307
SCALE: NONE				INDEX	SHEET 1 OF 1		

DWG: \\F:\19-m3\cadd\ARC\ARC\REDS\REDS Phase VIII\500_CAD\N203_Outdoor Substation Upgrade - T119 and T120\Sheet\A1---0810-E024_1_RB.dwg
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 Date: Apr 29, 2009 - 9:22:10 am

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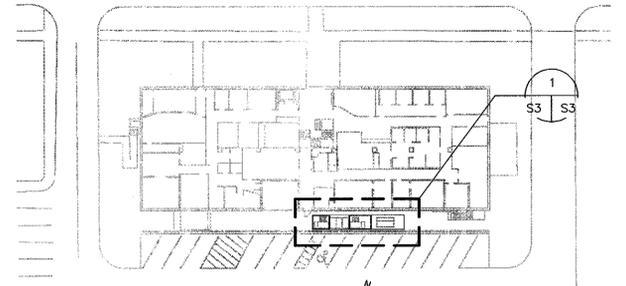
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 DATE: Apr 29, 2009 - 9:22:16 am

SHEET NOTES

1. FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4 AND S1.
2. LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
3. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
4. CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.

KEY NOTES

- 1 SAW CUT AND REPLACE PORTION OF (E) CONC SLAB-ON-GRADE AND AC PAVING AS INDICATED BY HATCHED AREAS AS INTERFERES W/INSTALLATION OF NEW TRANSFORMER CONTAINMENT CURB AND W/INSTALLATION OF GROUNDING SYSTEM, SEE ELECTRICAL DWGS.
- 2 REMOVE (E) AC PAVING TO END OF (N) EQUIPMENT PAD.
- 3 REMOVE (E) RAISED CONC PAD.
- 4 REMOVE (E) STL GUARDRAIL.
- 5 PORTION OF (E) RAISED CONC PAD TO REMAIN.
- 6 PORTION OF (E) RAISED CONC PAD TO BE REMOVED.
- 7 1/2" # HILTI HIT RE-500-SD ADHESIVE ANCHOR W/MIN 6" EMBEDMENT, 4 PER CABINET OR TRANSFORMER.
- 8 PROVIDE (N) CHAIN LINK FENCE WITH LIGHT BLUE SLATS, SEE SH1 S10 FOR FENCE DETAILS. ALIGN EDGE OF POST FOOTING TO EDGE OF CURB.
- 9 PROVIDE (N) WHEEL STOPS AND REPAINT (E) PARKING STRIPES IN COMPLIANCE W/CBC SECTION 11B (11TL). SEE DETAIL 1 SHEET S10.
- 10 (N) CONC PAD.
- 11 (N) CONC PAD SURFACE SHALL BE LEVELED UNDER TRANSFORMER BASE.



BASE BID

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 Moffett Field Permit Board
[Signature]
 Chief Building Official
 Permit No. 09Q038

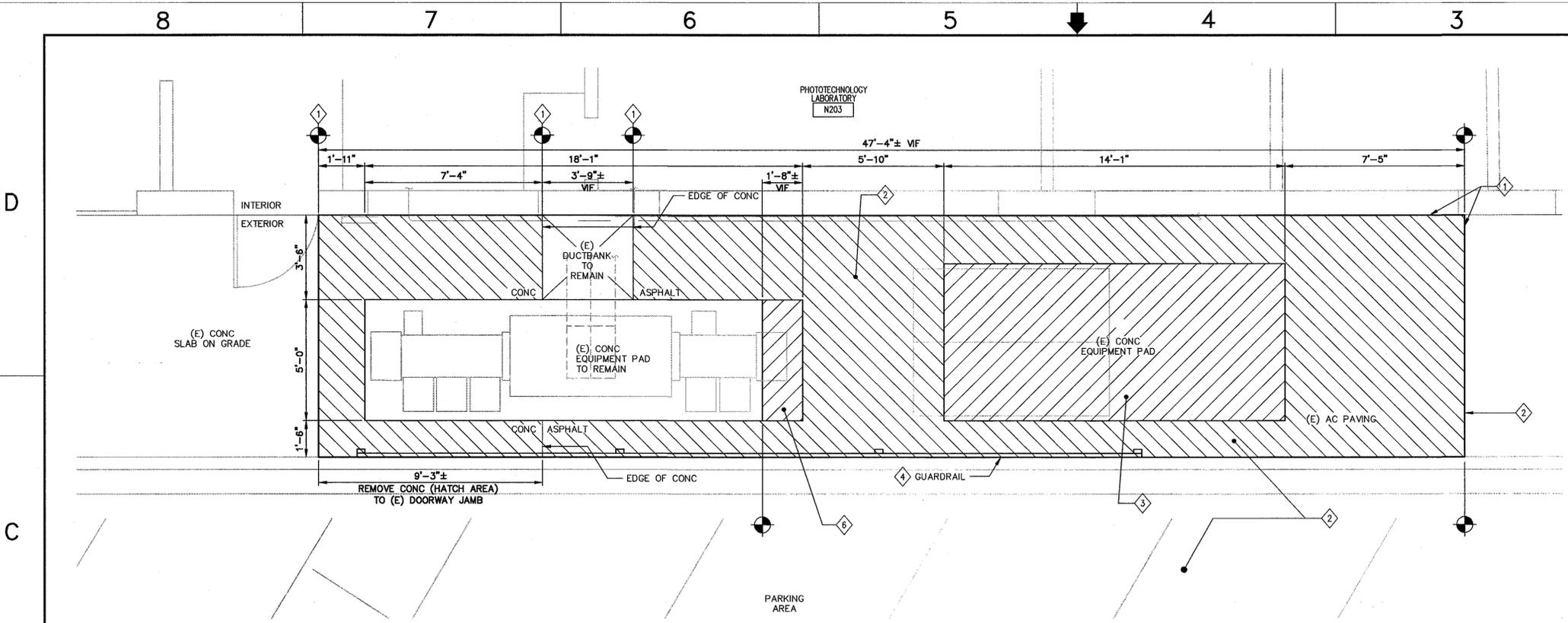
ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN P. ALDEN	DATE 4/30/09
DESIGNED A. FIROUZI	DATE 4/30/09
CHECKED M. CLUSTER	DATE 4/30/09
PROJECTOR N. NIZAMOVA	DATE 4/30/09
REQUESTER N. HSU	DATE 4/29/09
R&A	DATE

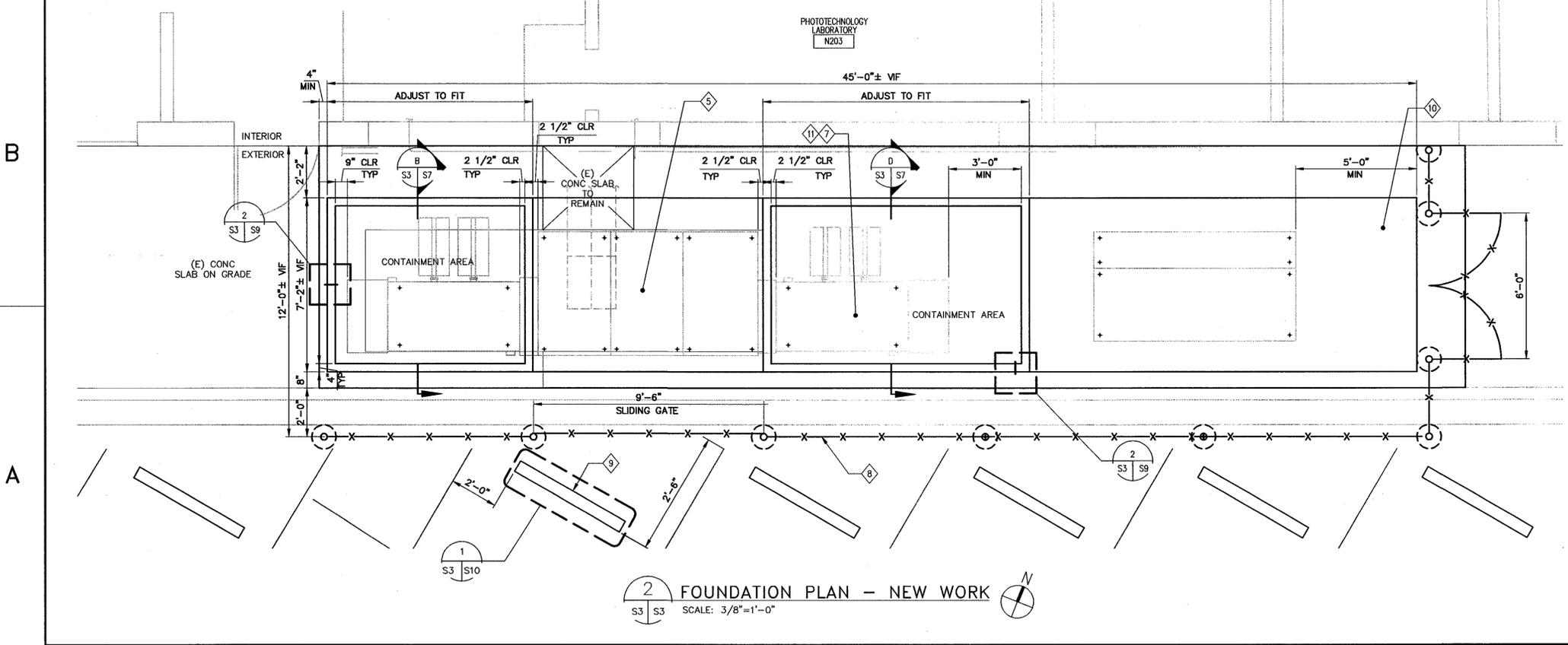
Ames Research Center
 Moffett Field, California
 RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII
 N203 & N204 OUTDOOR SUBSTATION UPGRADE
 STRUCTURAL

FOUNDATION PLAN DEMOLITION AND NEW WORK	
SUPERVISOR S. FRANKEL	DATE 6-5-09
SIZE D	CAGE CODE 25307
SCALE:	INDEX:
SHEET 1 OF 1	

FILE NAME:
A1---0810-S003_1_RB.DWG 4-30-09

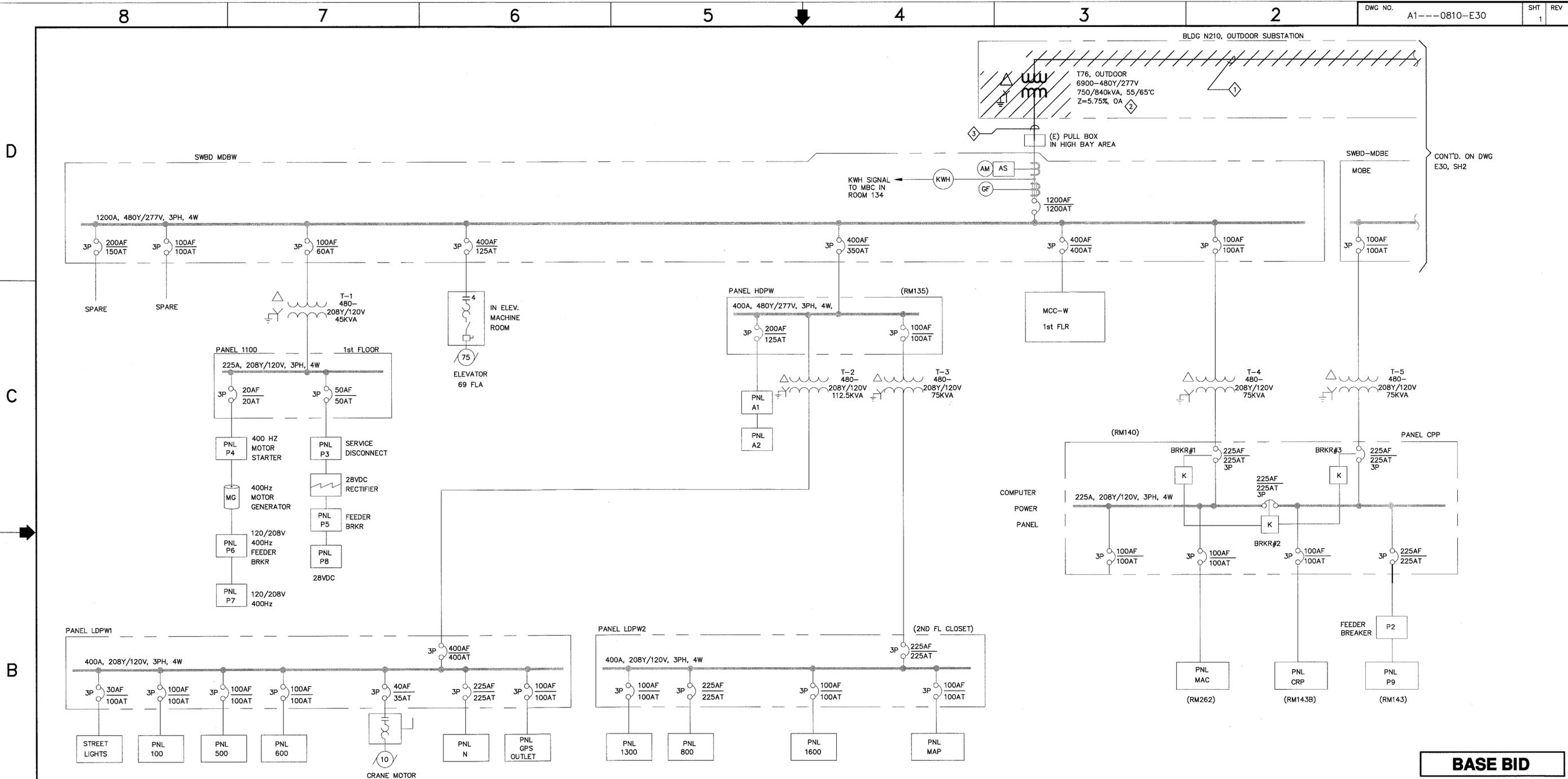


1 FOUNDATION PLAN - DEMOLITION
 S3 S3 SCALE: 3/8"=1'-0"



2 FOUNDATION PLAN - NEW WORK
 S3 S3 SCALE: 3/8"=1'-0"

60046720.0001



WEST

ONE LINE DIAGRAM-EXISTING/DEMOLITION
SCALE: NTS

BASE BID

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Moffett Field Permit Board
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Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD

SHEET NOTES

- FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON THE DRAWING.
- SINGLE LINE DIAGRAMS ARE BASED ON THE LATEST KNOWN EXISTING DRAWINGS.
- HATCHED LINES INDICATE EXISTING MATERIAL AND EQUIPMENT TO BE DEMOLISHED/ REMOVED, U.O.N.
- PRIOR TO SHUTDOWN AND DEMOLITION WORK, CONTRACTOR SHALL PERFORM PHASE SEQUENCE TEST ON EXISTING SYSTEM IN THE PRESENCE OF THE CONTRACTING OFFICER. ALL DISCONNECTED CABLES THAT ARE TO REMAIN SHALL BE PROPERLY IDENTIFIED, TAGGED FOR RESTORATION IN NEW WORK.

KEY NOTES

- REMOVE CONNECTION BETWEEN VCB412 AND TRANSFORMER T76.
- REMOVE EXISTING TRANSFORMER T76 AND ALL ASSOCIATED EQUIPMENT AND DEVICES. SEE DRAWING E33 FOR LAYOUT.
- (E) 4-(4-1/C-350kCMIL & 1/C #4/0) IN (4)-3" CONDUITS. PULL (E) WRES BACK TO THE PULL BOX LOCATED IN HIGH BAY AREA FOR LATER RECONNECTION.

DRAWN		DATE	
N.NIZAMOVA	4/30/09		
DESIGNED	DATE		
N.NIZAMOVA	4/30/09		
CHECKED	DATE		
J.McCLUSKER	4/30/09		
PREPARED	DATE		
N.NIZAMOVA	4/30/09		
REQUESTER	DATE		
N.HSU	4/30/09		
R&QA	DATE		
	DATE		
SAFETY	DATE		
	DATE		
SUPERVISOR	DATE		
S.FRANKEL	4/30/09		

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII
N210 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

**ONE LINE DIAGRAM
EXISTING/DEMOLITION**

SIZE	CAGE CODE	SCALE	INDEX	SHEET	OF
D	25307	A1---0810-E30		1	2

FILE NAME:
A1---0810-E030_1_L_R8.DWG 01-12-09

D:\E:\0-113\cadd\mec\ARC\VECS\VECS Phase VII\500_CAD\N210_Outdoor Substation Upgrade - 176 and 178\0-E030_1_R8.dwg Version: 17.1s (Aut Tech) User: polden DATE: Apr 30, 2009 - 5:57:14 pm

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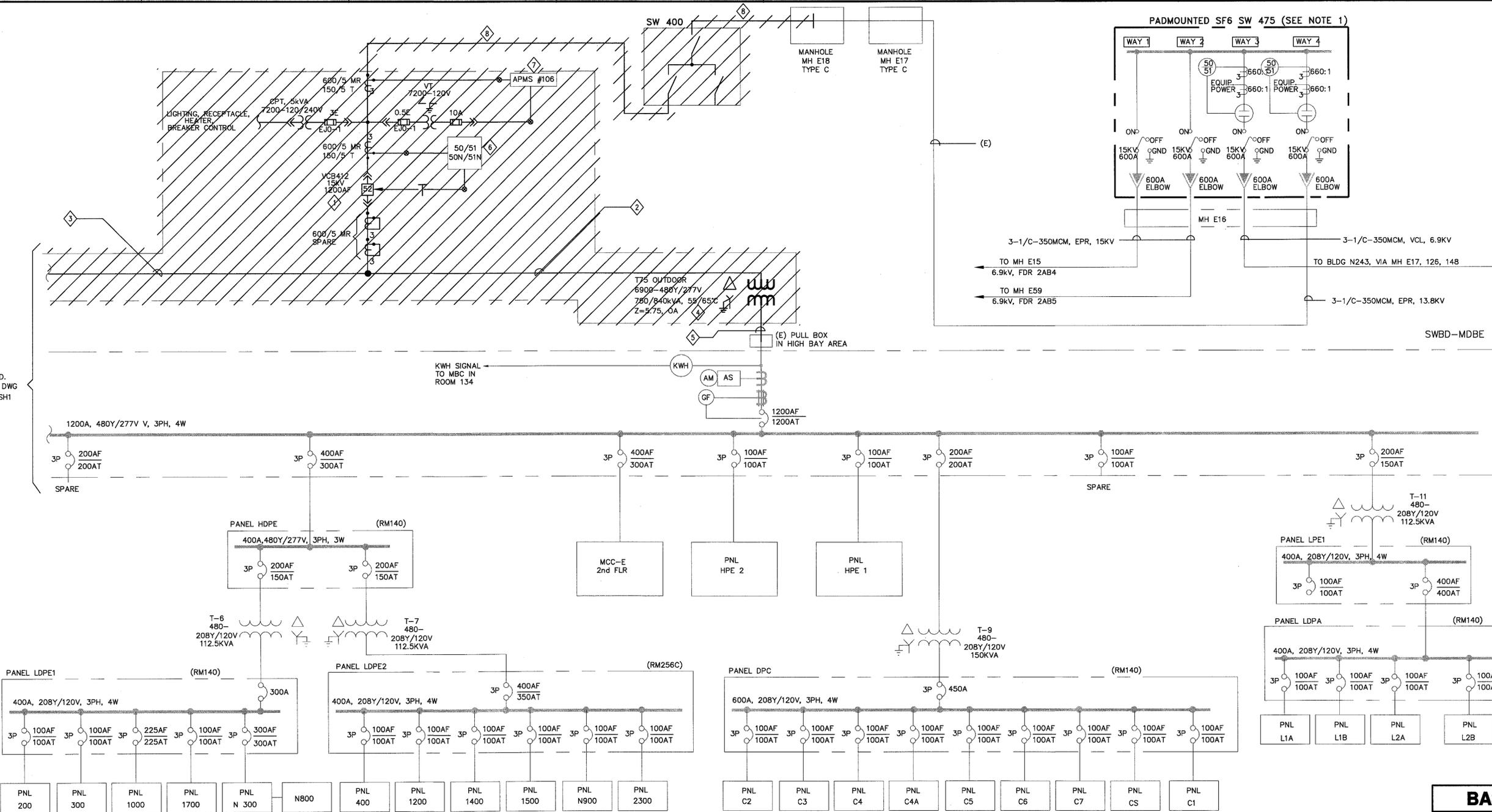
C

B

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A

A



CONT'D. FROM DWG E30, SH1

EAST

ONE LINE DIAGRAM-EXISTING/DEMOLITION
SCALE: NTS

REFERENCE DRAWINGS
A1---5805-E30 SYSTEM A & B SINGLE LINE DIAGRAM

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Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD

SHEET NOTES

- FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON THE DRAWING.
- SINGLE LINE DIAGRAMS ARE BASED ON THE LATEST KNOWN EXISTING DRAWINGS.
- HATCHED LINES INDICATE EXISTING MATERIAL AND EQUIPMENT TO BE DEMOLISHED/ REMOVED, U.O.N.
- PRIOR TO SHUTDOWN AND DEMOLITION WORK, CONTRACTOR SHALL PERFORM PHASE SEQUENCE TEST ON EXISTING SYSTEM IN THE PRESENCE OF THE CONTRACTING OFFICER. ALL DISCONNECTED CABLES THAT ARE TO REMAIN SHALL BE PROPERLY IDENTIFIED, TAGGED FOR RESTORATION IN NEW WORK.

KEY NOTES

- REMOVE EXISTING PRIMARY SWITCHGEAR AND CIRCUIT BREAKER VCB412 AND ALL ASSOCIATED EQUIPMENT AND DEVICES.
- REMOVE CONNECTION BETWEEN VCB412 AND TRANSFORMER T75.
- REMOVE CONNECTION BETWEEN VCB412 AND TRANSFORMER T76.
- REMOVE EXISTING TRANSFORMER T75 AND ALL ASSOCIATED EQUIPMENT AND DEVICES. SEE DRAWING E33 FOR LAYOUT.
- (E) 4-(4-1/C-350KCMIL & 1/C #4/0) IN (4)-3" CONDUITS. PULL (E) WIRES BACK TO THE PULL BOX LOCATED IN HIGH BAY AREA FOR LATER RECONNECTION.

KEY NOTES

- REMOVE ALSTOM RELAY AND PROTECT FROM DAMAGE FOR REINSTALLATION IN NEW WORK.
- REMOVE DIGITAL POWER METER AND PROTECT FROM DAMAGE FOR REINSTALLATION IN NEW WORK. DISCONNECT AND PULL OUT WIRES BACK TO COMMUNICATION PANEL LOCATED IN COMMUNICATION ROOM # 143A ON THE FIRST FLOOR. SEE KEY PLAN ON DRAWING E34 FOR LOCATION OF COMMUNICATION ROOM.
- DISCONNECT AND PULL EXISTING 15kV, 3-1/C 350KCMIL, 133% INSULATION, EPR CABLE AND 1/C #4/0 GND UP TO MH E18, CUT, TAPE AND COIL INSIDE THE MH FOR FUTURE RECONNECTION.

NO.	DATE	DESCRIPTION
1	4.30.09	DATE
2	4.30.09	DATE
3	4.30.09	DATE
4	4.30.09	DATE

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N210 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

ONE LINE DIAGRAM
EXISTING/DEMOLITION

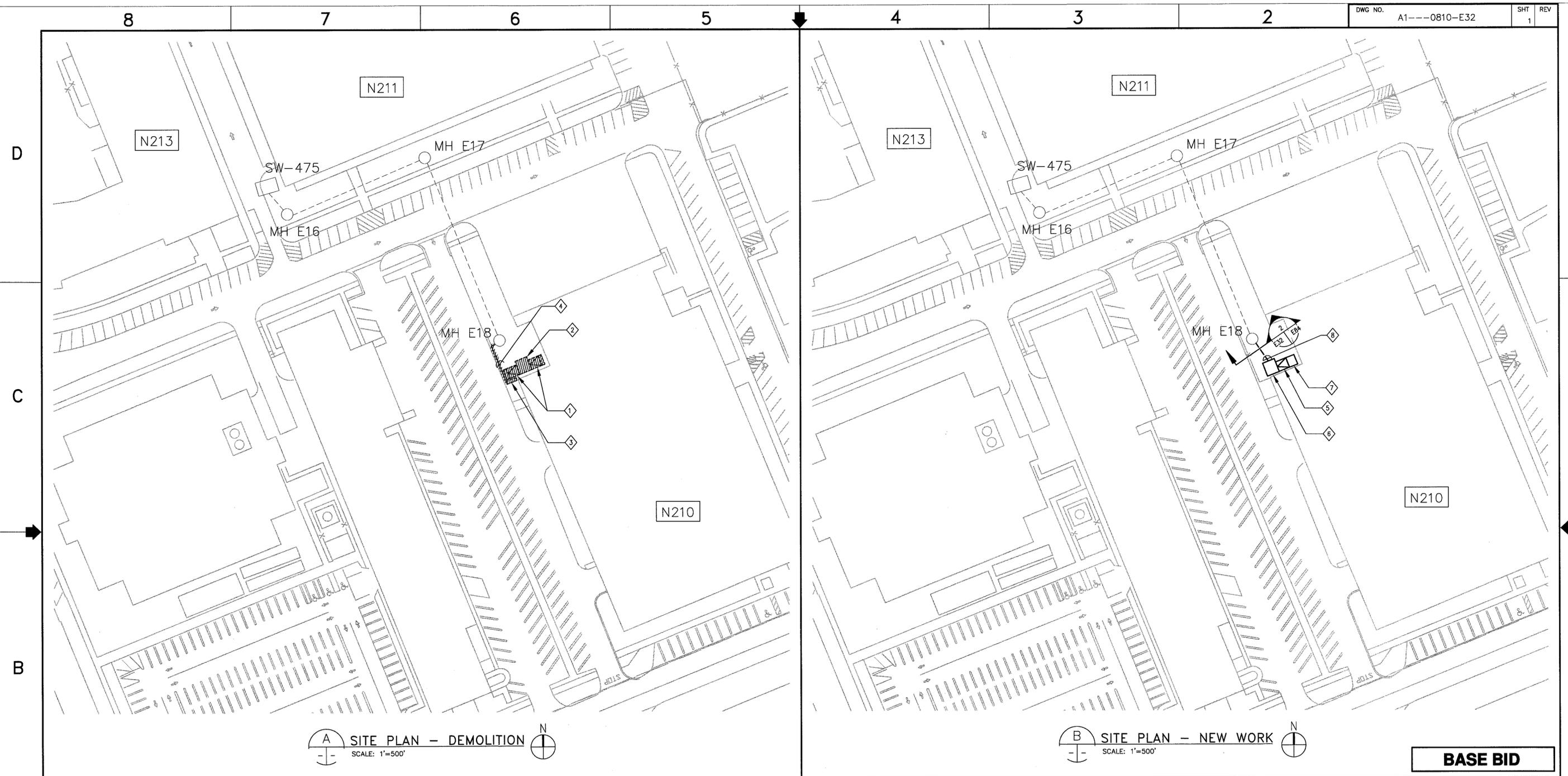
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 DATE: Apr 30, 2009 3:35:54 pm

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(A) SITE PLAN - DEMOLITION
SCALE: 1"=500'

(B) SITE PLAN - NEW WORK
SCALE: 1"=500'

BASE BID

SHEET NOTES

1. HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED, U.O.N.
2. CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS AT THE SITE AND SHALL BE RESPONSIBLE FOR THEIR ACCURACY PRIOR TO STARTING ANY WORK OR ORDERING ANY MATERIAL.

KEY NOTES

- 1 REMOVE (E) TRANSFORMERS T75 & T76 INCLUDING ALL ACCESSORIES.
- 2 REMOVE EXISTING PRIMARY SWITCHGEAR AND CIRCUIT BREAKER VCB412 AND ALL ASSOCIATED EQUIPMENT AND DEVICES.
- 3 REMOVE EXISTING ENCLOSURE WITH SWITCH.
- 4 DISCONNECT AND PULL EXISTING INCOMING CABLES BACK TO THE EXISTING MH E18, CUT, TAG & TAPE INSIDE THE MH FOR FUTURE RECONNECTION.
- 5 PROVIDE NEW OUTDOOR LIQUID FILLED 1500kVA TRANSFORMER T75 WITH DUAL RATED PRIMARY WINDING INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- 6 PROVIDE NEW 15kV, 1200A SWITCHGEAR WITH VACUUM CIRCUIT BREAKER VCB412, CPT, VT AND ALL ACCESSORIES PER SPECIFICATION SECTION 26 13 00.00 20.
- 7 PROVIDE OUTDOOR 480Y/277V SWITCHBOARD SWBD-1 WITH 2500A DRAW OUT TYPE MAIN CIRCUIT BREAKER WITH GFP AND TWO 1200A DRAW OUT TYPE FEEDER CIRCUIT BREAKERS WITH GFP.
- 8 PROVIDE NEW DUCT BANK FROM (E) MH E18 TO NEW MEDIUM VOLTAGE SWITCHGEAR. PULL NEW 15kV, 3-1/2" 350KCMIL, 133% INSULATION, EPR CABLE AND 1/2" #4 GND WIRES IN NEW DUCTS. SPLICE EXISTING AND NEW CABLES IN (E) MH E18.

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Moffett Field Permit Board
Mts bl
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DESIGNED	N.NIZAMOVA	DATE	4/30/09
CHECKED	J.MCUSKER	DATE	4/30/09
REQUESTER	N.NIZAMOVA	DATE	4/30/09
R&QA	N.HSU	DATE	6/24/09
SAFETY		DATE	
SUPERVISOR	S.FRANKEL	DATE	5/5/09

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII
N210 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

**SITE PLANS
DEMOLITION & NEW WORK**

SIZE	D	CAGE CODE	25307	REV	
SCALE	1"=500'	INDEX		SHEET	1 OF 1

FILE NAME:
A1---0810-032_1_R8.DWG 01-12-09

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 Version: 17.1s (IMS Tech) Date: Apr 30, 2009 3:38:22 pm

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DWG NO. A1---0810-E33

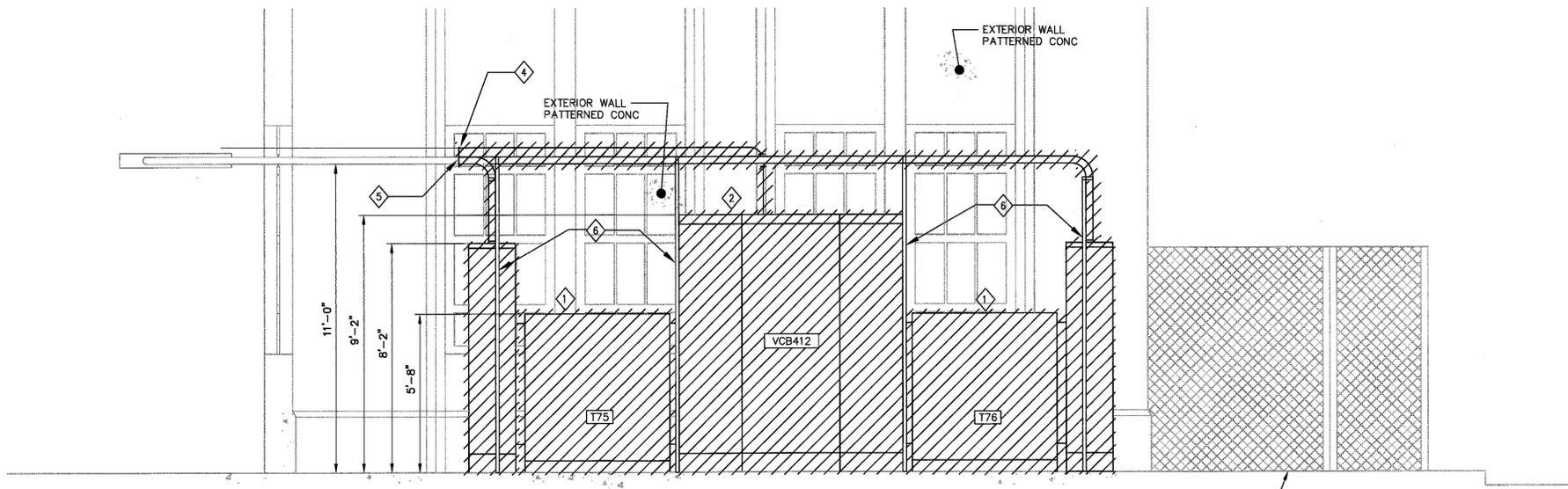
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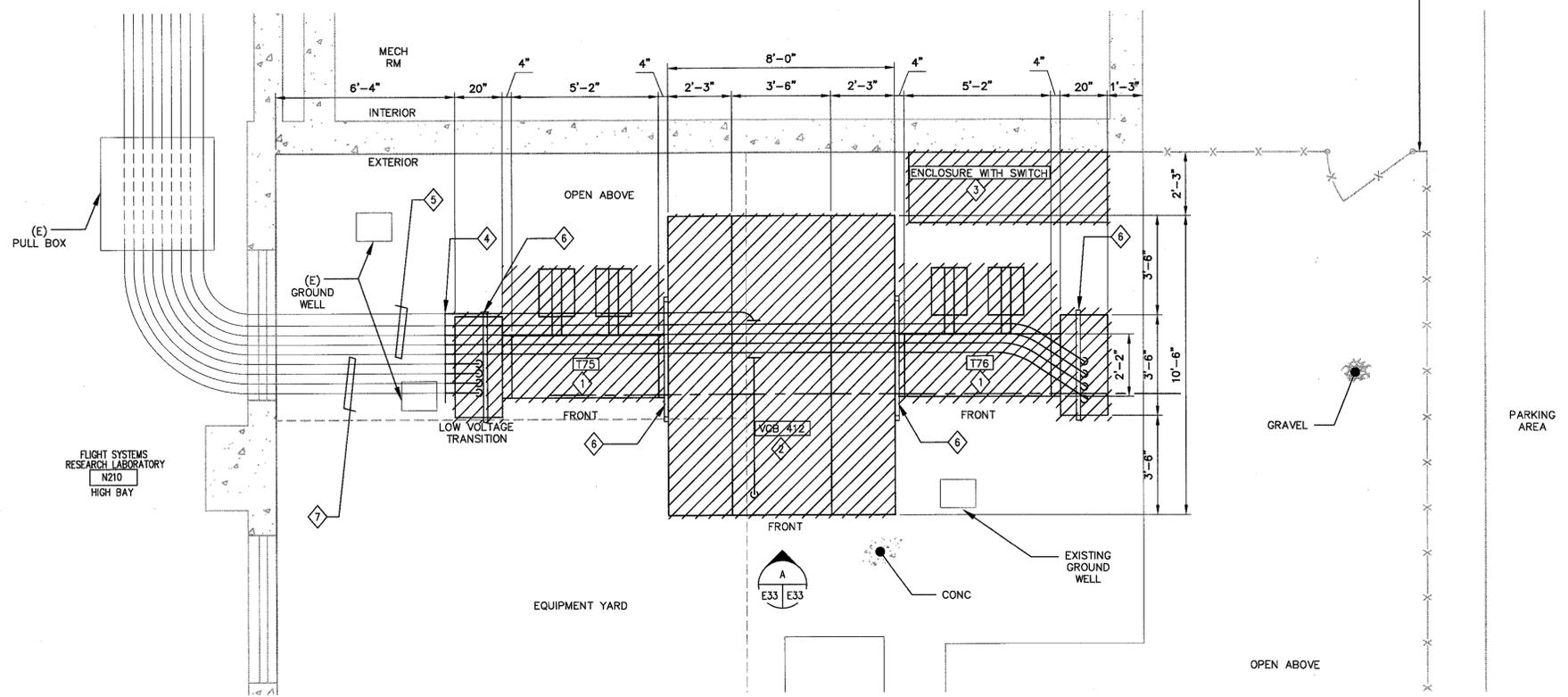
- 1. FOR GENERAL CONSTRUCTION NOTES, SYMBOLS AND ABBREVIATIONS SEE DRAWING G4.
- 2. HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED U.O.N.
- 3. ALL EXISTING CONDUITS AND CONDUCTORS SHALL BE DISCONNECTED FROM (E) EQUIPMENT AND RECONNECTED TO NEW EQUIPMENT, CONTRACTOR SHALL DETERMINE IN FIELD AND PROVIDE PULL BOXES AND RELOCATE/EXTEND OR REPLACE (E) CONDUITS AND CONDUCTORS (MATCH EXISTING SIZE) TO COMPLETE CONNECTIONS TO NEW AND EXISTING EQUIPMENT.
- 4. EXISTING GROUNDING SYSTEM TO REMAIN FOR RECONNECTION IN NEW WORK.
- 5. PRIOR TO SHUTDOWN AND DEMOLITION WORK, CONTRACTOR SHALL PERFORM PHASE SEQUENCE TEST ON EXISTING SYSTEM/EQUIPMENT IN THE PRESENCE OF COTR.

KEY NOTES

- 1 REMOVE EXISTING TRANSFORMERS T75 & T76 AND ALL ASSOCIATED EQUIPMENT AND DEVICES. SEE DRAWINGS E30, SH 1 AND E30, SH 2 FOR ONE LINE DIAGRAM.
- 2 REMOVE EXISTING PRIMARY SWITCHGEAR AND CIRCUIT BREAKER VCB412 AND ALL ASSOCIATED EQUIPMENT AND DEVICES.
- 3 REMOVE EXISTING ENCLOSURE WITH SWITCH.
- 4 DISCONNECT (E) 3/4" CONDUIT FROM (E) SWITCHGEAR AND CUT AS SHOW ON THE DRAWING. DISCONNECT AND PULL OUT WIRES BACK TO COMMUNICATION PANEL LOCATED IN COMMUNICATION ROOM # 143A ON THE FIRST FLOOR. SEE KEY PLAN ON DRAWING E34 FOR COMMUNICATION ROOM LOCATION.
- 5 CUT (E) (4)-3" CONDUITS AS SHOWN ON THE DRAWING. PULL (E) 4-(4)-1/C-350KCMIL & 1/C #3/0 WIRES BACK TO THE PULL BOX LOCATED IN HIGH BAY AREA, COIL AND TAPE INSIDE THE PULL BOX.
- 6 EXISTING METAL CONDUIT SUPPORT SHALL BE REMOVED AND SAVED FOR FUTURE INSTALLATION IN NEW WORK.
- 7 CUT (E) (4)-3" CONDUITS AS SHOWN ON THE DRAWING. CUT (E) 4-(4)-1/C-350KCMIL & 1/C #3/0 WIRES IN THE PULL BOX LOCATED IN HIGH BAY AREA.



A EQUIPMENT ELEVATION - DEMOLITION SCALE: 3/8"=1'-0"



1 EQUIPMENT PLAN - DEMOLITION SCALE: 3/8"=1'-0"

BASE BID

Approved for Construction Moffett Field Permit Board

Chief Building Official Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD

REVISIONS	DATE
DESIGNED N.NIZAMOVA	4.30.09
CHECKED J.MCCUSKER	4.30.09
PROJNGR N.NIZAMOVA	4.30.09
REQUESTER N.HSU	4.30.09
SAFETY	
SUPERVISOR S.FRANKEL	4.30.09

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N210 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

EQUIPMENT PLAN & ELEVATION EXISTING/DEMOLITION

SIZE D	CAGE CODE 25307	SCALE:	INDEX	SHEET 1 OF 1
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FILE NAME: A1---0810-E033_1_R8.DWG 03-03-09

DWG: \\F:\19-033\04\ARC\BDS\BDS Phase VIII\500_CAD\N210_Outdoor Substation Upgrade - T75 and T76\Sheet\A1---0810-E033_1_R8.dwg Version: 17.1s (LMS Tech) User: pdelen DATE: Apr 30, 2009 - 3:38:42 pm

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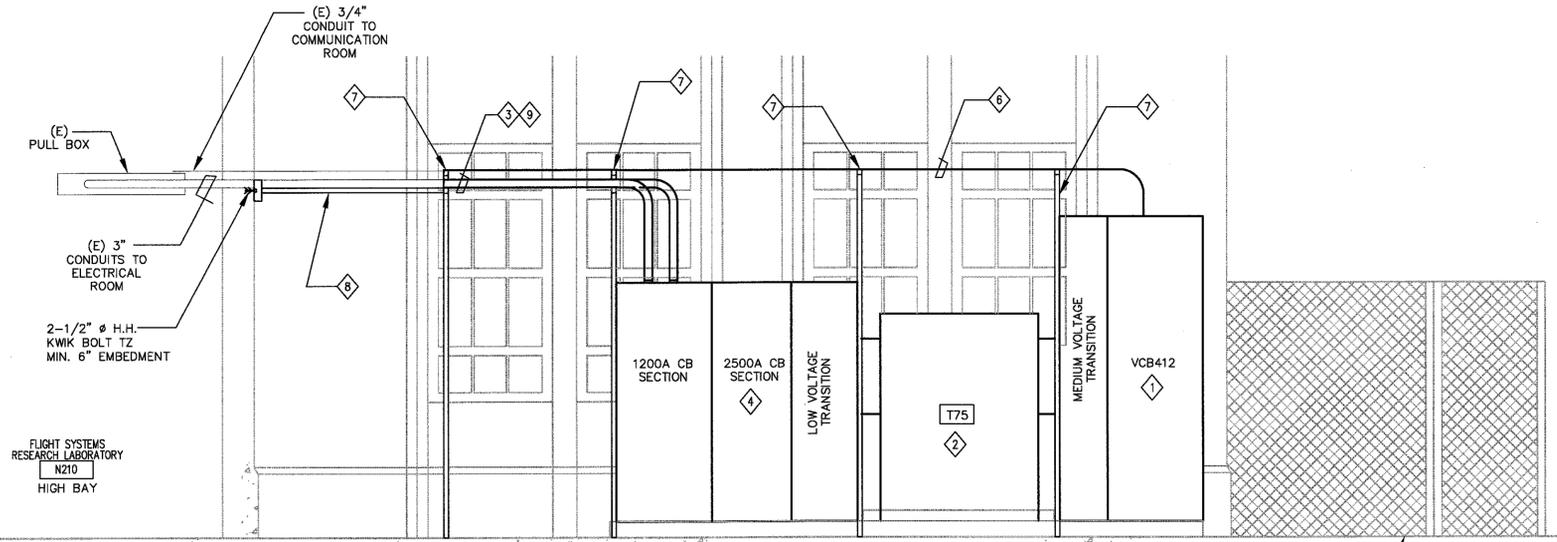
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SHEET NOTES

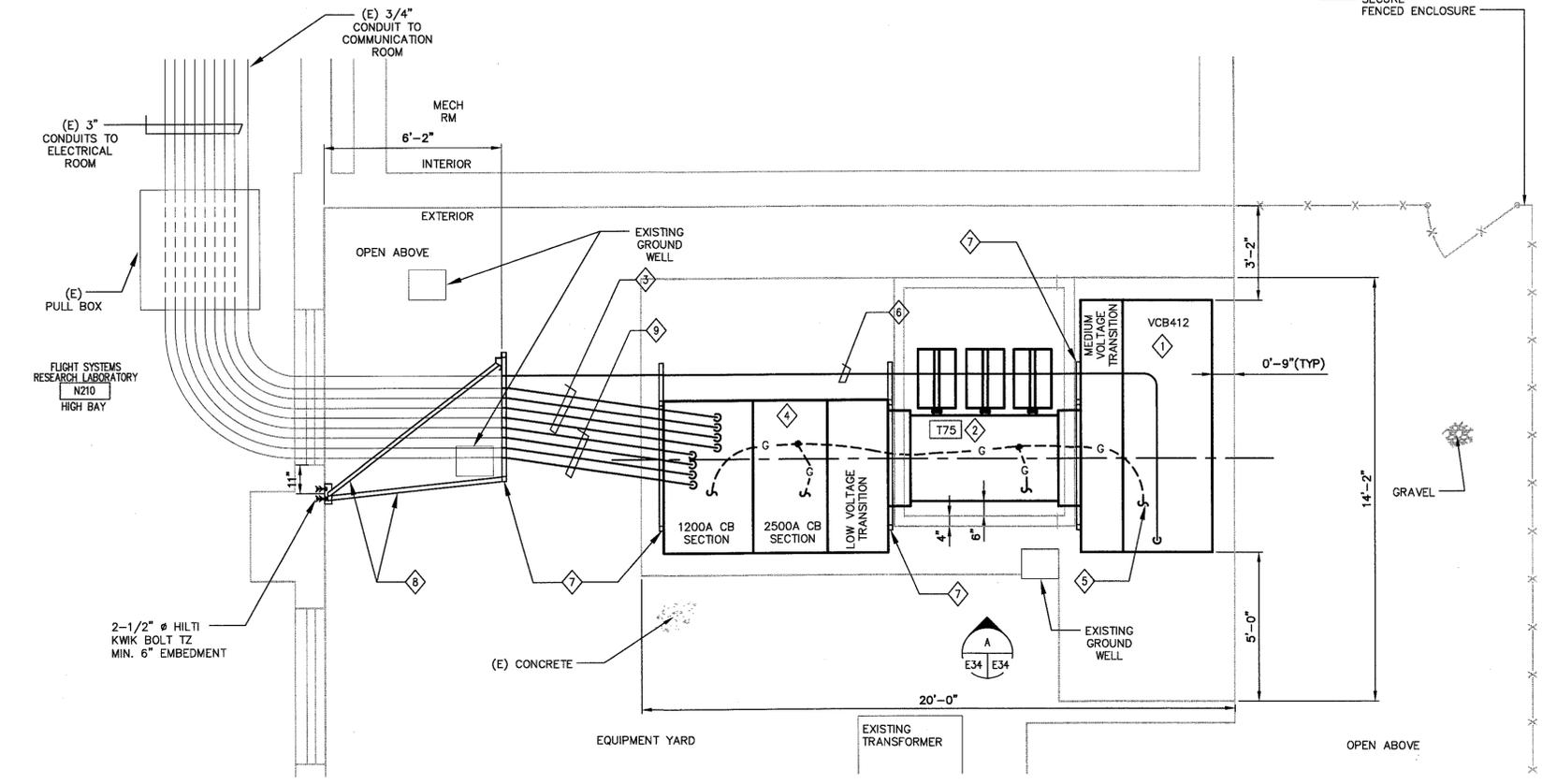
- 1. FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4.
- 2. LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
- 3. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- 4. CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.
- 5. ALL EXISTING CONDUITS AND CONDUCTORS SHALL BE RECONNECTED TO NEW EQUIPMENT. CONTRACTOR SHALL DETERMINE IN FIELD AND PROVIDE PULL BOXES AND RELOCATE/EXTEND OR REPLACE (E) CONDUITS AND CONDUCTORS (MATCH EXISTING SIZE) TO COMPLETE CONNECTIONS TO NEW AND EXISTING EQUIPMENT.
- 6. SEE STRUCTURAL DRAWINGS S4, S7 & S9 FOR DETAILS.

KEY NOTES

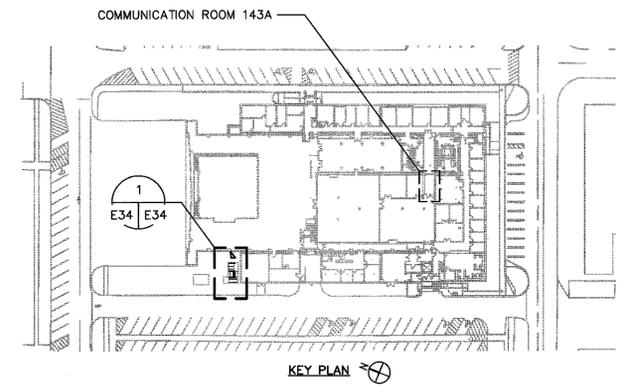
- 1 PROVIDE NEW 15kV, 1200A SWITCHGEAR WITH VACUUM CIRCUIT BREAKER VCB412, CPT, VT AND ALL ACCESSORIES PER SPECIFICATION SECTION 26 13 00.00 20.
- 2 PROVIDE NEW OUTDOOR LIQUID-FILLED TRANSFORMER T75 WITH DUAL RATED PRIMARY WINDING, LIQUID-FILLED TRANSFORMER SHALL BE LESS FLAMMABLE VEGETABLE-BASED OIL TYPE WITH ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- 3 EXTEND (E) 3" CONDUITS TO NEW SWITCHBOARD LOCATION. PULL (E) 4-(4-1/C-350kCML & 1/C #3/0) FROM (E) PULL BOX IN HIGH BAY AREA TO NEW OUTDOOR 480Y/277V SWITCHBOARD SWBD-1.
- 4 PROVIDE OUTDOOR 480Y/277V SWBD-1 WITH 2500A DRAW OUT TYPE MAIN CIRCUIT BREAKER WITH GFP AND TWO 1200A DRAW OUT TYPE FEEDER CIRCUIT BREAKERS WITH GFP.
- 5 CONNECT NEW EQUIPMENT TO EXISTING GROUNDING SYSTEM WITH #4/0 BARE COOPER CONDUCTOR.
- 6 EXTEND (E) 3/4" CONDUIT TO LOCATION OF NEW SWITCHGEAR AS SHOWN ON THE DRAWING. PROVIDE NEW CAT 5E WIRES IN EXISTING AND NEW CONDUIT FROM COMMUNICATION PANEL TO APMS #106. NO SPLICES ON THESE WIRES! PROVIDE ADDITIONAL 25 FEET OF CABLE AND RJ-45 CONNECTORS AT EACH END. ETHERNET CABLE HOOK UP TO COMMUNICATION PANEL AND APMS #106 WILL BE PERFORMED BY OTHERS. APPROXIMATE DISTANCE IS 320 FEET. SEE KEY PLAN THIS DRAWING FOR COMMUNICATION ROOM LOCATION.
- 7 REINSTALL METAL SUPPORT STRUCTURE FOR CONDUITS REMOVED DURING DEMOLITION OR PROVIDE NEW SUPPROT IF EXISTING SUPPORT WAS DAMAGED, DESTROYED DURING DEMOLITION WORK OR INADEQUATE. ATTACH THE SUPPORT TO ELECTRICAL CABINET AT THE TOP AND TO THE FOOTING AT THE BOTTOM.
- 8 PROVIDE P1000 DIAGONAL SUPPORT. BRACE TO THE WALL AT EACH CORNER OF (E) SUPPORT.
- 9 EXTEND (E) 3" CONDUITS TO NEW SWITCHBOARD LOCATION. PROVIDE (N) 4-(4-1/C-350kCML & 1/C #3/0) FROM (E) PULL BOX IN HIGH BAY AREA TO NEW OUTDOOR 480Y/277V SWITCHBOARD SWBD-1. SPLICE WITH (E) WIRES INSIDE PULL BOX IN HIGH BAY AREA.



EQUIPMENT ELEVATION - NEW WORK SCALE: 3/8"=1'-0"



EQUIPMENT PLAN - NEW WORK SCALE: 3/8"=1'-0"



BASE BID

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN N.NIZAMOVA	DATE 4.30.09
DESIGNED N.NIZAMOVA	DATE 4.30.09
CHECKED J.MCCUSKER	DATE 4.30.09
PROJ MGR N.NIZAMOVA	DATE 4.30.09
REQUESTER N.HSU	DATE 4.30.09
R&GA	DATE
SAFETY	DATE
SUPERVISOR S.FRANKEL	DATE 5.2.09

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII
N210 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

EQUIPMENT PLAN & ELEVATION NEW WORK

SIZE D	CAGE CODE 25307	FILE NAME A1---0810-E34	REV 1
SCALE	INDEX	SHEET 1 OF 1	

FILE NAME: A1---0810-E34_1_RB.DWG 4-30-09

DWG: \\p1419-r13\cadd\ARC\BEC\BES\BES\Phase VII\500_CAD\N210_Outdoor_Substation_Upgrade - T75 and T76\Sheet\A1---0810-E34_1_RB.dwg Version: 17.1s (LMS Tech) User: pdolan DATE: Apr 30, 2009 - 3:30:04 pm

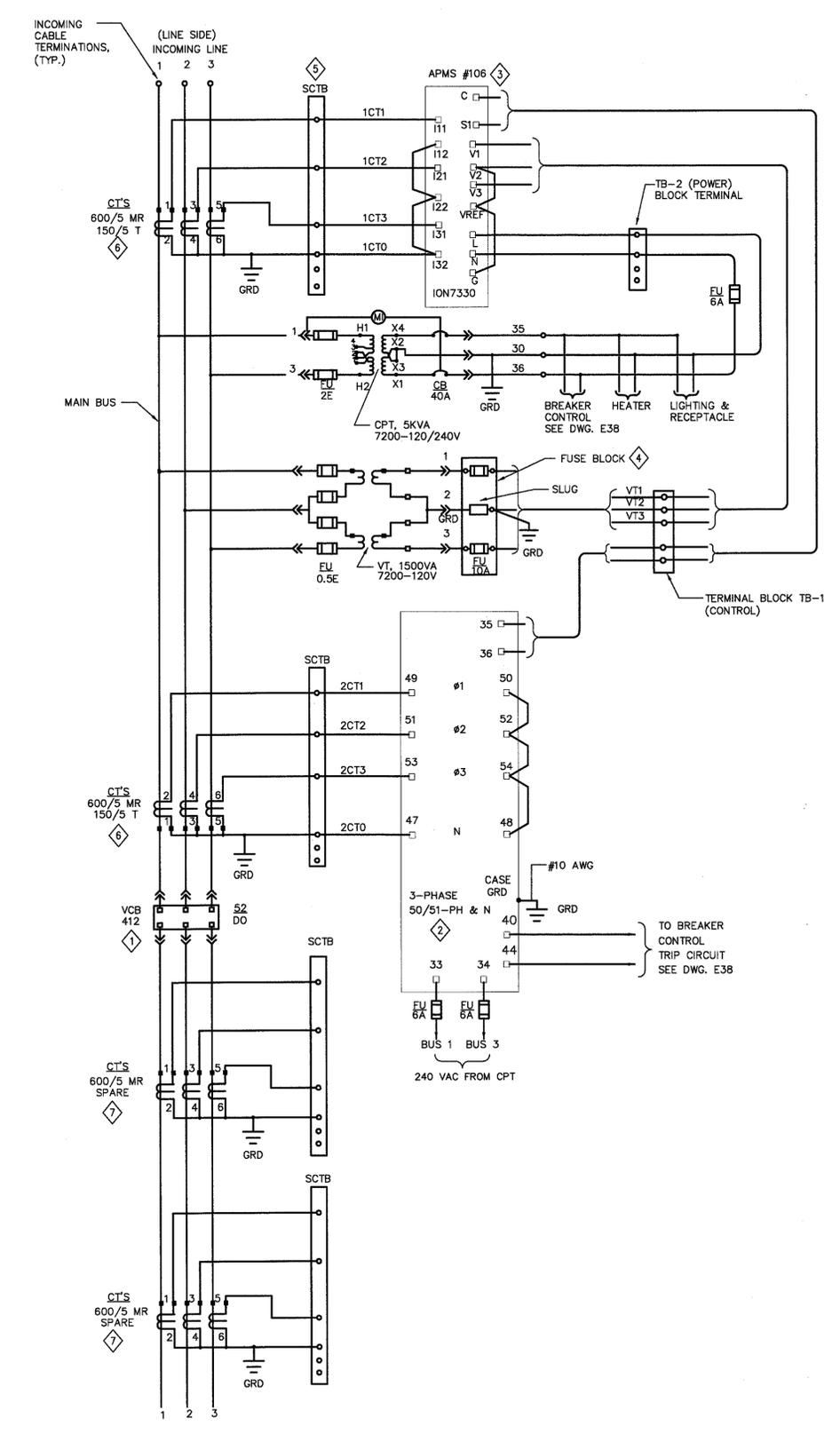
60046720.0001

SHEET NOTES

1. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
2. THE DIAGRAM IS PROVIDED FOR GUIDANCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT INCLUDING TERMINAL BLOCKS, TERMINAL IDENTIFICATION NUMBER, CONNECTIONS ETC. AND REVISE DRAWINGS AS NEEDED TO MATCH EXISTING AND NEW EQUIPMENT TO PROVIDE A COMPLETE FUNCTIONAL SYSTEM.
3. ALL CT WIRES SHALL BE #10 AWG MINIMUM, TYPE SIS. ALL VOLTAGE, CPT SECONDARY AND BREAKER TRIP WIRES SHALL BE #12 AWG MINIMUM, TYPE SIS. U.O.N.

KEY NOTES

- 1 PROVIDE NEW 15KV, 1200A SWITCHGEAR WITH 15KV VACUUM CIRCUIT BREAKER AND ACCESSORIES PER SPECIFICATION.
- 2 REINSTALL (E) ALSTOM RELAY AND COMPLETELY WIRE IT INTO THE NEW EQUIPMENT.
- 3 REINSTALL (E) DIGITAL POWER METER REMOVED FROM (E) SWITCHGEAR AND COMPLETELY WIRE IT TO THE NEW SWITCHGEAR. INSTALLATION SHALL BE IN ACCORDANCE WITH DRAWING E85. SEE KEY NOTE 6 ON DRAWING E34 FOR CONNECTION DETAILS.
- 4 PROVIDE FUSE BLOCK, FLEXCORE KLK-3 OR APPROVED EQUAL.
- 5 PROVIDE (4) CIRCUIT SHORTING TERMINAL BLOCKS (SCTB), FLEXCORE 1KU6SC OR APPROVED EQUAL.
- 6 PROVIDE (2) SETS OF 3 WINDOW-TYPE MULTI-RATIO CT'S ON THE LINE SIDE OF THE BREAKER.
- 7 PROVIDE (2) ADDITIONAL SPARE SETS OF CT'S ON THE LOAD SIDE OF THE BREAKER. ALL CT'S SHALL BE C200 ACCURACY.



1 THREE LINE DIAGRAM-NEW WORK
SCALE: N.T.S.

BASE BID

Approved for Construction
Moffett Field Permit Board
M. S. [Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DRAWN	N.NIZAMOVA	DATE	4/30/09		
DESIGNED	N.NIZAMOVA	DATE	4/30/09		
CHECKED	J.McCLUSKER	DATE	4/30/09		
PRJ/MGR	N.NIZAMOVA	DATE	4/30/09		
REQUESTER	N.HSU	DATE	4/30/09		
R&QA		DATE			
SAFETY		DATE			
SUPERVISOR	S.FRANKEL	DATE	5/25/09		

Ames Research Center Moffett Field, California	
RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII N210 OUTDOOR SUBSTATION UPGRADE ELECTRICAL	
THREE LINE DIAGRAM NEW WORK	
SIZE	D
CAGE CODE	25307
SCALE	1"=1'-0"
INDEX	
SHEET	OF
FILE NAME:	A1---0810-E037_1_R8.DWG
	01-12-09

DWG: \\f1918-n3\cadd\mc\mc\REDS\REDS Phase VII\500_CAD\N210_Outdoor Substation Upgrade - T75 ord 176\Sheet\1---0810-E037_1_R8.dwg User: pdlden
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8

7

6

5

4

3

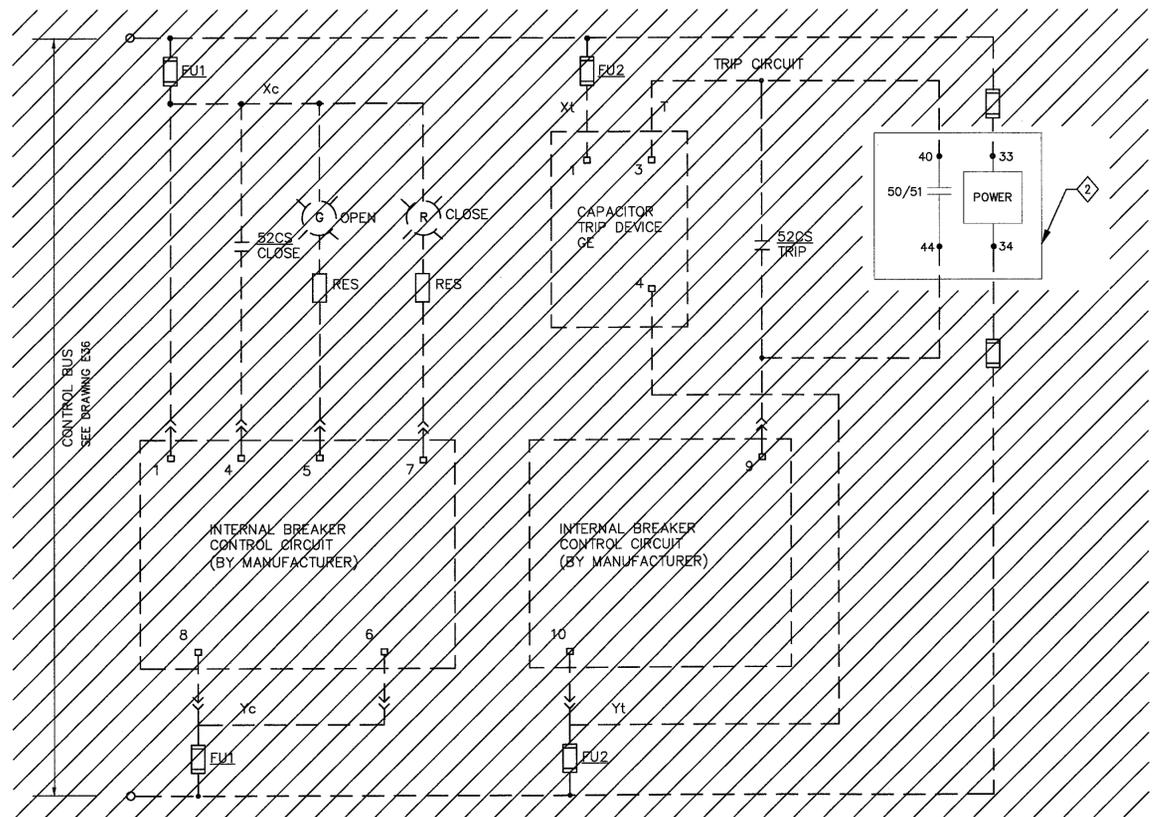
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SHEET NOTES

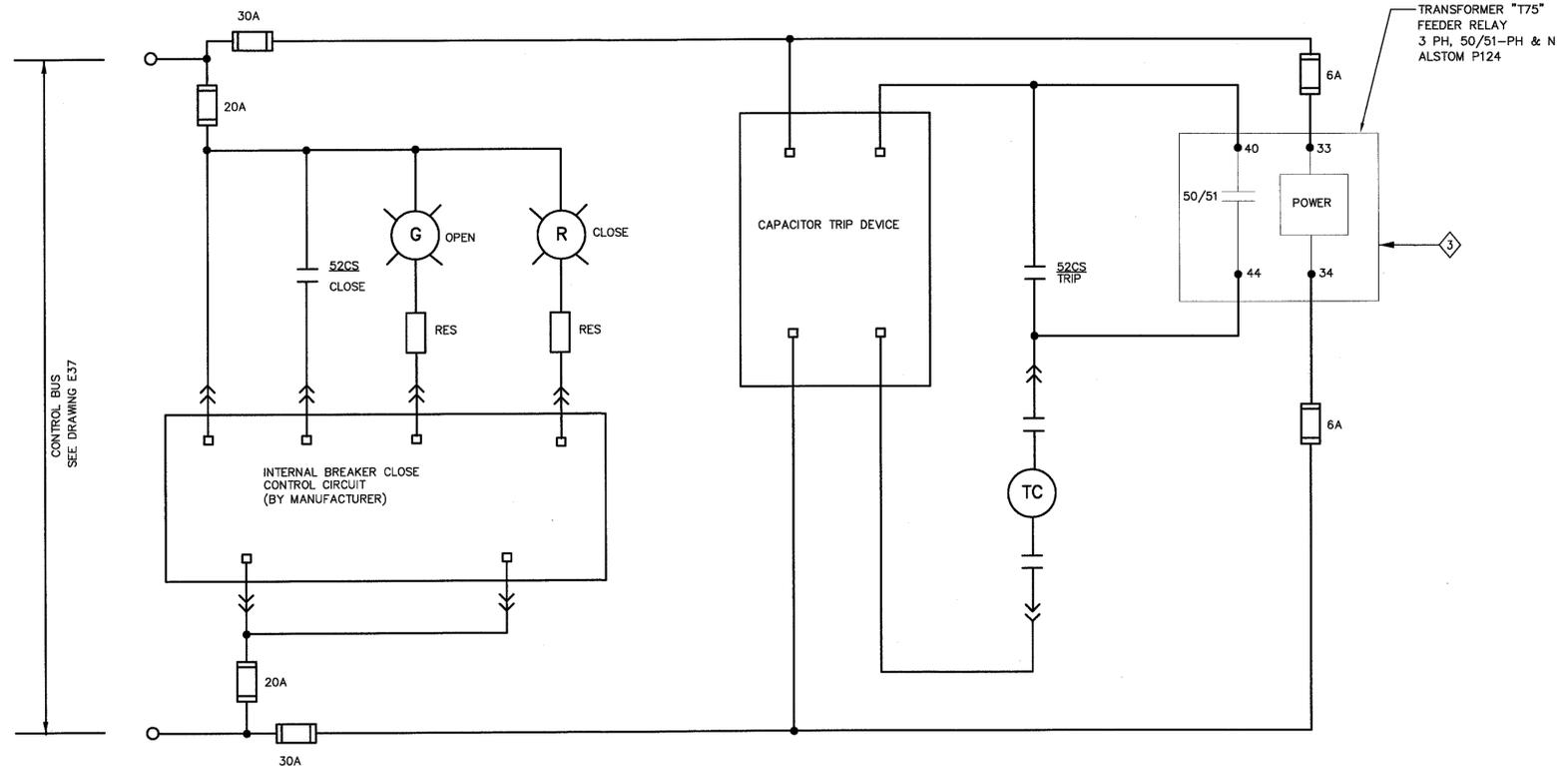
- 1. HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED. U.O.N.
- 2. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- 3. THE DIAGRAMS ARE PROVIDED FOR GUIDANCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT INCLUDING TERMINAL BLOCKS, TERMINAL IDENTIFICATION NUMBER, CONNECTIONS ETC. AND REVISE DRAWINGS AS NEEDED TO MATCH EXISTING AND NEW EQUIPMENT TO PROVIDE A COMPLETE FUNCTIONAL SYSTEM.
- 4. THE CONTROL DIAGRAMS ARE BASED ON THE LATEST KNOWN EXISTING DRAWINGS.
- 5. NEW TERMINAL MARKINGS ARE BASED ON CUTLER HAMMER INFORMATION.

KEY NOTES

- 1 DISCONNECT AND REMOVE EXISTING VCB412 SWITCHGEAR INCLUDING ALL ASSOCIATED DEVICES AND ACCESSORIES.
- 2 REMOVE ALSTOM RELAY FROM (E) SWITCHGEAR AND SAVE FOR INSTALLATION IN NEW WORK.
- 3 REINSTALL ALSTOM RELAY REMOVED FROM (E) SWITCHGEAR AND COMPLETELY WIRE IT INTO THE NEW EQUIPMENT.
- 4 TYPICAL BREAKER CONTROL DIAGRAM WITH THE RELATED TRANSFORMER FEEDER RELAYS. FOR SUBSTATION ONE LINE DIAGRAM AND THREE LINE DIAGRAM, REFER TO THE DRAWINGS E31 AND E37 RESPECTIVELY.



VCB412 BREAKER CONTROL DIAGRAM - DEMOLITION



VCB412 BREAKER CONTROL DIAGRAM - NEW WORK

BASE BID

Approved for Construction
Moffett Field Permit Board
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	N.NIZAMOVA	DATE	4/22/09
DESIGNED	N.NIZAMOVA	DATE	4/29/09
CHECKED	J.MCCUSKER	DATE	4/30/09
FORWARD	N.NIZAMOVA	DATE	4/30/09
REQUESTER	N.HSU	DATE	4/29/09
R&QA		DATE	
SAFETY		DATE	
SUPERVISOR	S.FRANKEL	DATE	5/2/09

Ames Research Center
Moffett Field, California

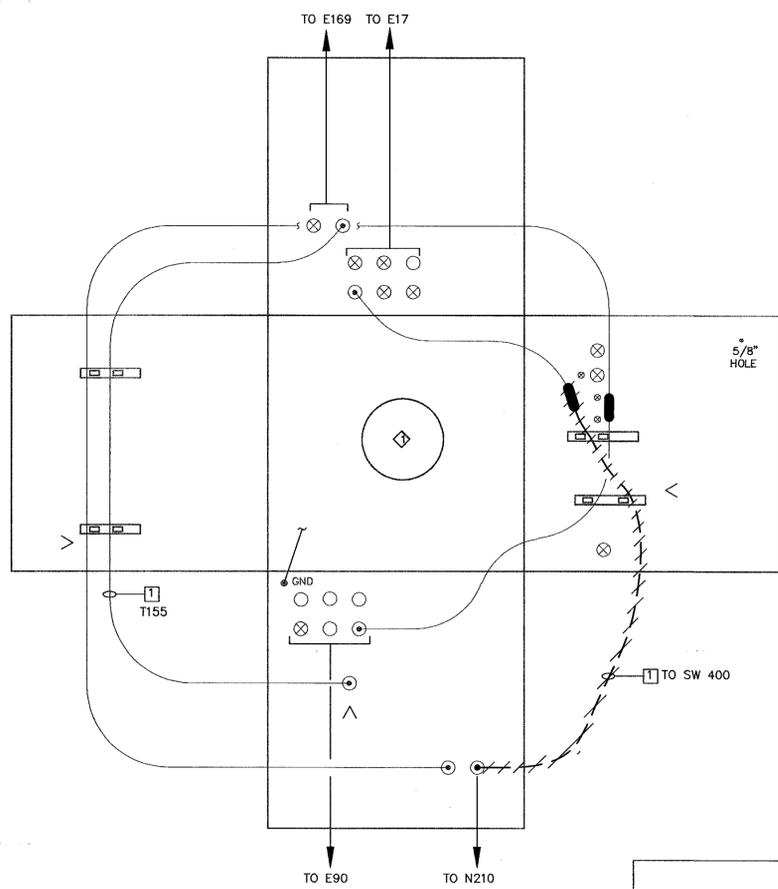
RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N210 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

VCB088 BREAKER CONTROL DIAGRAM-DEMOLITION & NEW WORK

SIZE	D	CAGE CODE	25307
SCALE	1"=1'-0"	INDEX	
FILE NAME:	A1---0810-E038_1_RB.DWG		

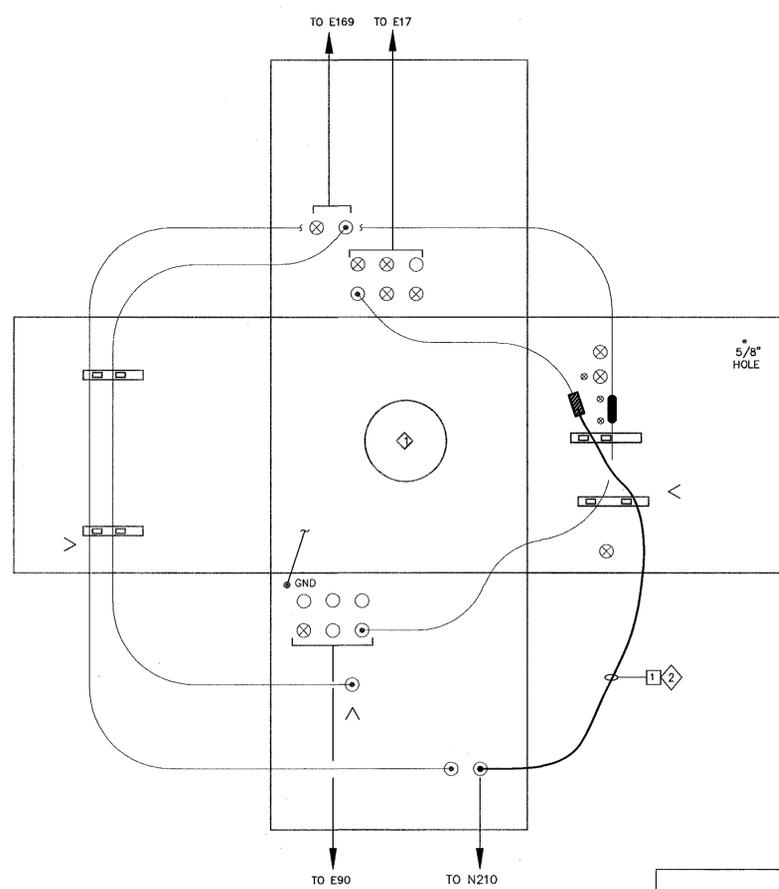
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CABLE DESCRIPTION	
1	15KV, 3-1/C-500 MCM, EPR CABLE

1 MANHOLE NO. E18 DETAIL - EXISTING/DEMOITION (N. W. Corner Of N210) SCALE: NTS



CABLE DESCRIPTION	
1	15 KV, 3-1/C-350kcmil, EPR CABLE & 1/C # 4 GND

2 MANHOLE NO. E18 DETAIL - NEW WORK (N. W. Corner Of N210) SCALE: NTS

BASE BID

SHEET NOTES

- SHEET NOTES #1,2,3 ARE NOT PART OF THIS CONTRACT (THE INTENTION IS FOR NASA 'IN-HOUSE' USE).
- THIS DRAWING IS NOT THE CONTROLLED NASA AMES CONFIGURATION MANAGEMENT BASELINE DRAWING.
- THE AMES CONFIGURATION MANAGEMENT BASELINE DRAWING THAT WAS USED TO CREATE THE PROJECT DRAWING IS A1---9801-E18.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON DRAWING.
- HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED, U.O.N.
- CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS AT THE SITE AND SHALL BE RESPONSIBLE FOR THEIR ACCURACY PRIOR TO STARTING ANY WORK OR ORDERING ANY MATERIAL.
- UPON COMPLETION OF CABLE WORK AND PRIOR ENERGIZATION, CONTRACTOR SHALL INFORM GOVERNMENT FOR TAKING AS-BUILT PHOTOS AND UPDATING OF NASA REFERENCE DWG.
- FOR N210 OUTDOOR SUBSTATION SITE PLAN - EXISTING/DEMO AND NEW WORK SEE DRAWING E32.
- LIGHT LINES INDICATE EXISTING CONDITION AND DARK LINES INDICATE NEW WORK.
- NEW CABLE ROUTING INSIDE THE MANHOLE IS SHOWN DIAGRAMMATICALLY. EXACT CABLE ROUTING INSIDE MANHOLE SHALL BE IN ACCORDANCE WITH DWG E86.

KEY NOTES

- DISCONNECT EXISTING CABLE FROM N210 SUBSTATION VCB088 SWITCHGEAR AND REMOVE UP TO MH E18. CUT, TAPE AND TAG INSIDE MH E18.
- PROVIDE 15KV, 3-1/C-350KCMIL, 133 % INS., EPR CABLE AND 1/C #4 GND FROM MH E18 TO VCB 088. SPLICE WITH (E) CABLE INSIDE MH E18. INSTALL FEEDER IDENTIFICATION TAG & PHASE IDENTIFICATION COLOR TAPE.
- MANHOLE OPENING SIZE: 30"DIA x 6" DEEP.
- ALL INFORMATION INCLUDED IN THIS DETAIL IS CONSIDERED AS EXISTING CONDITIONS BASED ON LATEST KNOWN EXISTING DRAWINGS.

NASA REFERENCE DRAWINGS

A1---9801-E18 UNDERGROUND POWER DISTRIBUTION MANHOLE E18 DETAIL.

Approved for Construction
Moffett Field Permit Board
Nils Klu
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	N.NIZAMOVA	DATE	4/30/09
DESIGNED	N.NIZAMOVA	DATE	4/30/09
CHECKED	J.MCCLUSKER	DATE	4/30/09
PROJ.MGR	N.NIZAMOVA	DATE	4/30/09
REQUESTER	N.HSU	DATE	9/2/09
R&Q		DATE	

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N210 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

**MANHOLE MH E18 DETAILS-
EXISTING/DEMOLITION & NEW WORK**

SUPERVISOR	S.FRANKEL	DATE	5-15-09
SAFETY		DATE	

SIZE	D	CAGE CODE	25307
SCALE:		INDEX	
SHEET	OF		

DWG: \\f19-m3\cad\ARC\REDS\REDS Phase VII\500_CAD\N210_Outdoor Substation Upgrade - 175 and 176\Sheet\A1---0810-E039_1_RB.dwg User: polden
 DATE: Apr 29, 2009 8:23:13 am Version: 17.1s (LMS Tech)

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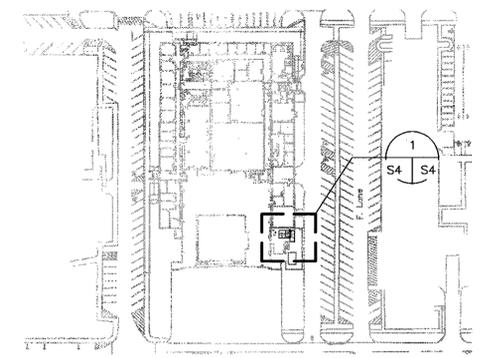
DWG NO. A1---0810-S4 SHT 1 REV

SHEET NOTES

1. FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4 AND S1.
2. LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
3. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
4. CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.

KEY NOTES

- 1 1/2"Ø HILTI HIT RE-500-SD ADHESIVE ANCHOR W/MIN 8" EMBEDMENT, 4 PER CABINET OR TRANSFORMER.
- 2 (N) CONC PAD.
- 3 (N) CONC PAD SURFACE SHALL BE LEVELED UNDER TRANSFORMER BASE.



BASE BID

Approved for Construction
 Moffett Field Permit Board
M. Guster
 Chief Building Official
 Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN P. ALDEN	DATE 1/24/09
DESIGNED A. FIROUZ	DATE 4/30/09
CHECKED M. GUSTER	DATE 4/30/09
PROJECTOR N. NIZAMOVA	DATE 4/30/09
REQUESTER N. HSU	DATE 4/30/09
R&QA	DATE
SAFETY	DATE
SUPERVISOR S. FRANKEL	DATE 5-7-09

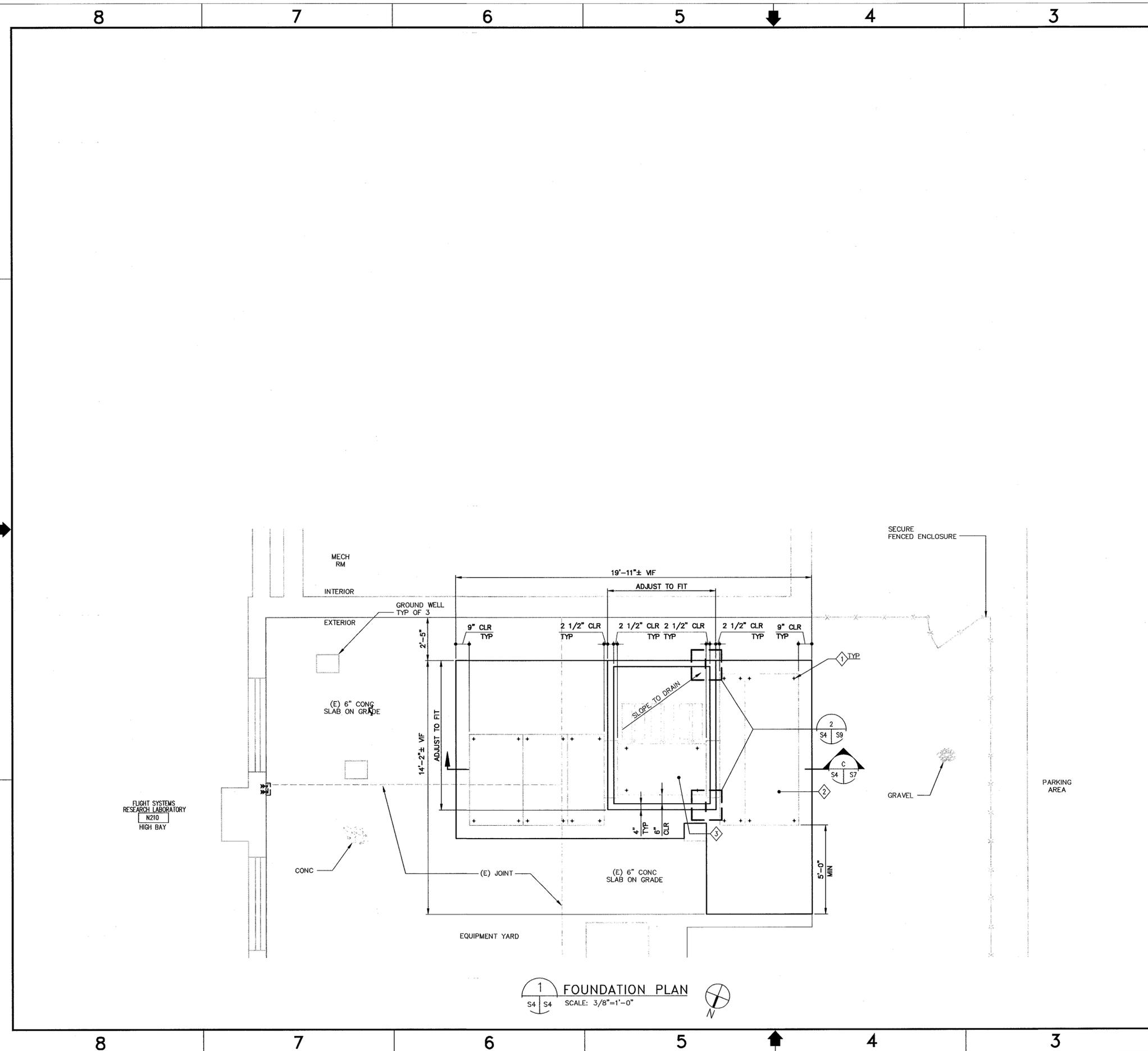
Ames Research Center
 Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM—PHASE VIII
 N210 OUTDOOR SUBSTATION UPGRADE
 STRUCTURAL

FOUNDATION PLAN

SIZE D	CAGE CODE 25307	SCALE	INDEX	SHEET 1 OF 1
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FILE NAME:
 A1---0810-5004_L_R8.DWG 4-30-09



1 FOUNDATION PLAN
 SCALE: 3/8"=1'-0"

60046720.0001

SHEET NOTES

- FOR GENERAL CONSTRUCTION NOTES, SYMBOLS AND ABBREVIATIONS SEE DRAWING G4.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON THE DRAWING.
- SINGLE LINE DIAGRAM IS BASED ON THE LATEST KNOWN EXISTING NASA DRAWING.
- HATCHED LINES INDICATE EXISTING MATERIAL AND EQUIPMENT TO BE DEMOLISHED/REMOVED, U.O.N.
- PRIOR TO SHUTDOWN AND DEMOLITION WORK, CONTRACTOR SHALL PERFORM PHASE SEQUENCE TEST ON EXISTING SYSTEM/EQUIPMENT IN THE PRESENCE OF COTR. ALL DISCONNECTED CABLES/EQUIPMENT SHALL BE PROPERLY IDENTIFIED, TAGGED/LABELLED FOR RESTORATION IN NEW WORK.
- FOR ONE LINE DIAGRAM - NEW WORK SEE DRAWING E46.

KEY NOTES

- EXISTING 15KV INCOMING CABLE FROM SW454 TO VCB503 TO REMAIN.
- REMOVE CONNECTION BETWEEN LOAD INTERRUPTER SWITCH AND TRANSFORMER T130.
- REMOVE CONNECTION BETWEEN LOAD INTERRUPTER SWITCH AND TRANSFORMER T15.
- REMOVE EXISTING TRANSFORMER T130 AND ALL ASSOCIATED EQUIPMENT AND DEVICES, SEE DRAWING E48 FOR LAYOUT.
- REMOVE CONNECTION BETWEEN TRANSFORMER T130 AND LV MAIN DISTRIBUTION PANEL 'MDP-B'.

ADDITIVE 1

Approved for Construction
Moffett Field Permit Board
Mitsuba
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	N.NIZAMOVA	DATE	4.30.09
DESIGNED	N.NIZAMOVA	DATE	4.30.09
CHECKED	J.MCCUSKER	DATE	4.30.09
PROJGR	N.NIZAMOVA	DATE	4.30.09
REQUESTER	N.HSU	DATE	9/20/09
R&A	R&A	DATE	
SAFETY		DATE	
SUPERVISOR	S.FRANKEL	DATE	8/20/09

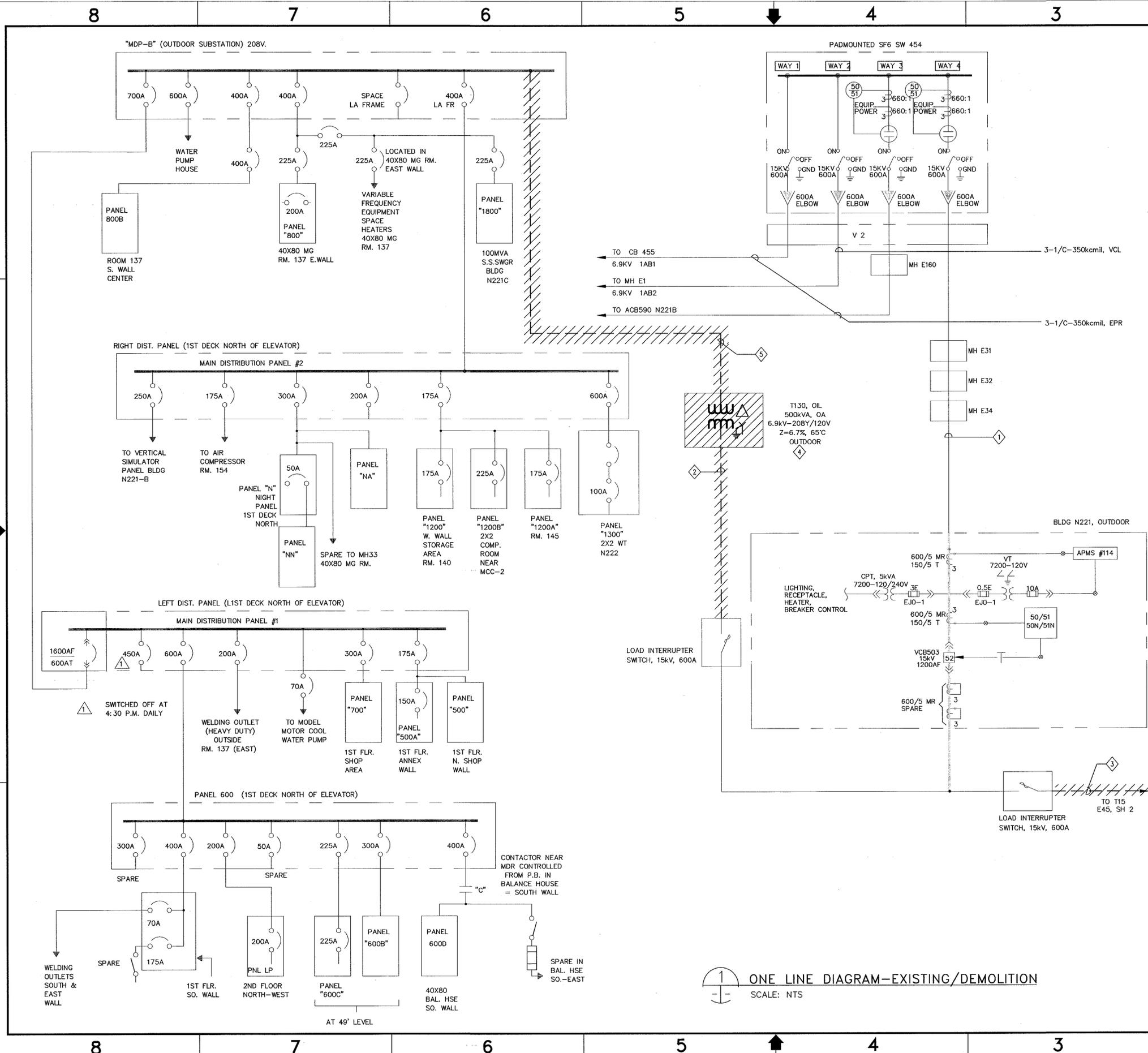
Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N221 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

ONE LINE DIAGRAM
EXISTING/DEMOLITION

SIZE	D	CAGE CODE	25307	REV	
SCALE	AS NOTED	INDEX		SHEET	1 OF 2

FILE NAME:
A1---0810-E045_1_R8.DWG 4-30-09



ONE LINE DIAGRAM-EXISTING/DEMOLITION
SCALE: NTS

DWG: \\f19-m13\load\ARC\REDS\REDS Phase VII\500_CAD\N221_Outdoor Substation Upgrade - T15 and T130\Sheet\A1---0810-E045_1_R8.DWG User: palben
 DATE: Apr 29, 2009 9:23:23 am

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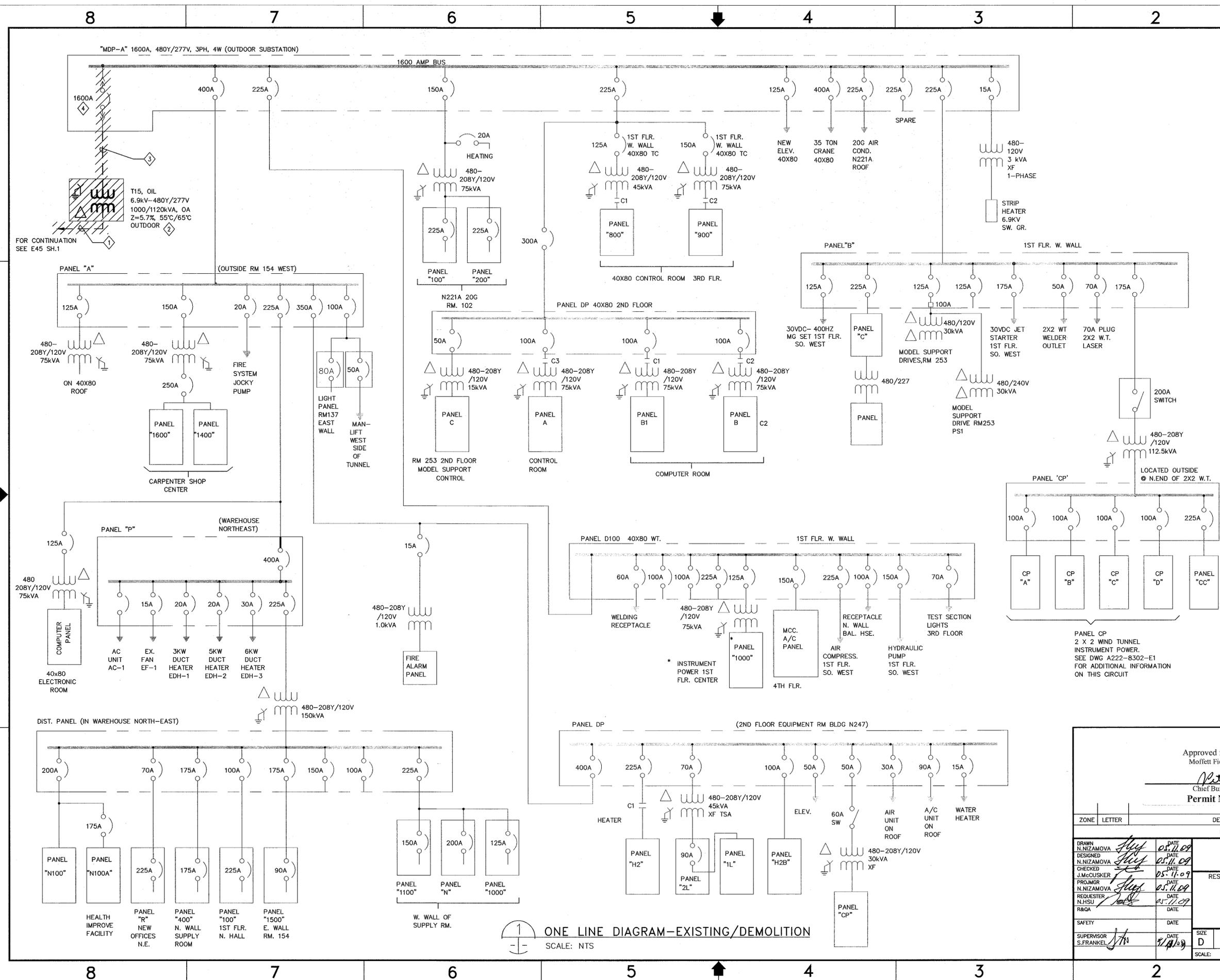
SHEET NOTES

- FOR GENERAL CONSTRUCTION NOTES, SYMBOLS AND ABBREVIATIONS SEE DRAWING G4.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON THE DRAWING.
- SINGLE LINE DIAGRAMS ARE BASED ON THE LATEST KNOWN EXISTING DRAWING.
- HATCHED LINES INDICATE EXISTING MATERIAL AND EQUIPMENT TO BE DEMOLISHED/REMOVED, U.O.N.
- PRIOR TO SHUTDOWN AND DEMOLITION WORK, CONTRACTOR SHALL PERFORM PHASE SEQUENCE TEST ON EXISTING SYSTEM/EQUIPMENT IN THE PRESENCE OF COTR. ALL DISCONNECTED CABLES/EQUIPMENT SHALL BE PROPERLY IDENTIFIED, TAGGED/LABELLED FOR RESTORATION IN NEW WORK.
- FOR ONE LINE DIAGRAM - NEW WORK SEE DRAWING E46.

KEY NOTES

- REMOVE CONNECTION BETWEEN LOAD INTERRUPTER SWITCH AND TRANSFORMER T15.
- REMOVE EXISTING TRANSFORMER T15 AND ALL ASSOCIATED EQUIPMENT AND DEVICES. SEE DRAWING E48 FOR LAYOUT.
- REMOVE CONNECTION BETWEEN TRANSFORMER T15 AND LV MAIN DISTRIBUTION PANEL "MDP-A".
- REMOVE (E) 1600A MAIN CIRCUIT BREAKER.

ADDITIVE 1



ONE LINE DIAGRAM-EXISTING/DEMOLITION
SCALE: NTS

Approved for Construction
Moffett Field Permit Board

[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD

DATE	REVISIONS
05.11.09	
05.11.09	
05.11.09	
05.11.09	
05.11.09	

DRAWN N.NIZAMOVA	DATE 05.11.09	<p>Ames Research Center Moffett Field, California</p>
DESIGNED N.NIZAMOVA	DATE 05.11.09	
CHECKED J.McCUSKER	DATE 05.11.09	
PROJ.MGR N.NIZAMOVA	DATE 05.11.09	
REQUESTER N.HSU	DATE 05.11.09	
RCA	DATE	

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N221 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

**ONE LINE DIAGRAM
EXISTING/DEMOLITION**

SAFETY	DATE	SIZE	CAGE CODE	REV
SUPERVISOR S.FRANKEL	DATE 05.11.09	D	25307	A

SCALE: AS NOTED INDEX SHEET 2 OF 2

FILE NAME: A1---0810-E45_2_R8.DWG 03-04-09

DWG: P:\ARC\BEDS\BEDS Phase VII\500_C40\N221_Outdoor_Substation_Upgrade - T15 and T130\Sheet\A1---0810-E45_2_R8.DWG Version: 17.1s (LUS Tech) User: cywong
 DATE: May 11, 2009 - 11:45:08 am

80046720.0001

SHEET NOTES

- FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4.
- SINGLE LINE DIAGRAM IS BASED ON THE LATEST KNOWN EXISTING NESA DRAWING.
- LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON DWG.
- DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- THE DIAGRAM IS PROVIDED FOR GUIDANCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT INCLUDING TERMINAL BLOCKS, TERMINAL IDENTIFICATION NUMBER, CONNECTIONS ETC. AND REVISE DRAWINGS AS NEEDED TO MATCH EXISTING AND NEW EQUIPMENT TO PROVIDE A COMPLETE FUNCTIONAL SYSTEM.
- CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.
- SEE DRAWING E80 FOR NAMEPLATE SCHEDULE.

KEY NOTES

- PROVIDE NEW OUTDOOR LIQUID-FILLED 500kVA 13.8x7.2kV-208Y/120V TRANSFORMER T130, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- RESTORE ALL CONNECTIONS TO EXISTING EQUIPMENT, SO SYSTEM WILL BE OPERATIONAL. EXTEND WIRES AS NECESSARY.

ADDITIVE 1

Approved for Construction
Moffett Field Permit Board
M. H. ...
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN N.NIZAMOVA	DATE 4.30.09
DESIGNED N.NIZAMOVA	DATE 4.30.09
CHECKED J.MCCUSKER	DATE 4.30.09
PREPARED N.NIZAMOVA	DATE 4.30.09
REQUESTER N.HSU	DATE 4.30.09
R&QA	DATE
SAFETY	DATE
SUPERVISOR S.FRANKEL	DATE 5.2.09

Ames Research Center
Moffett Field, California

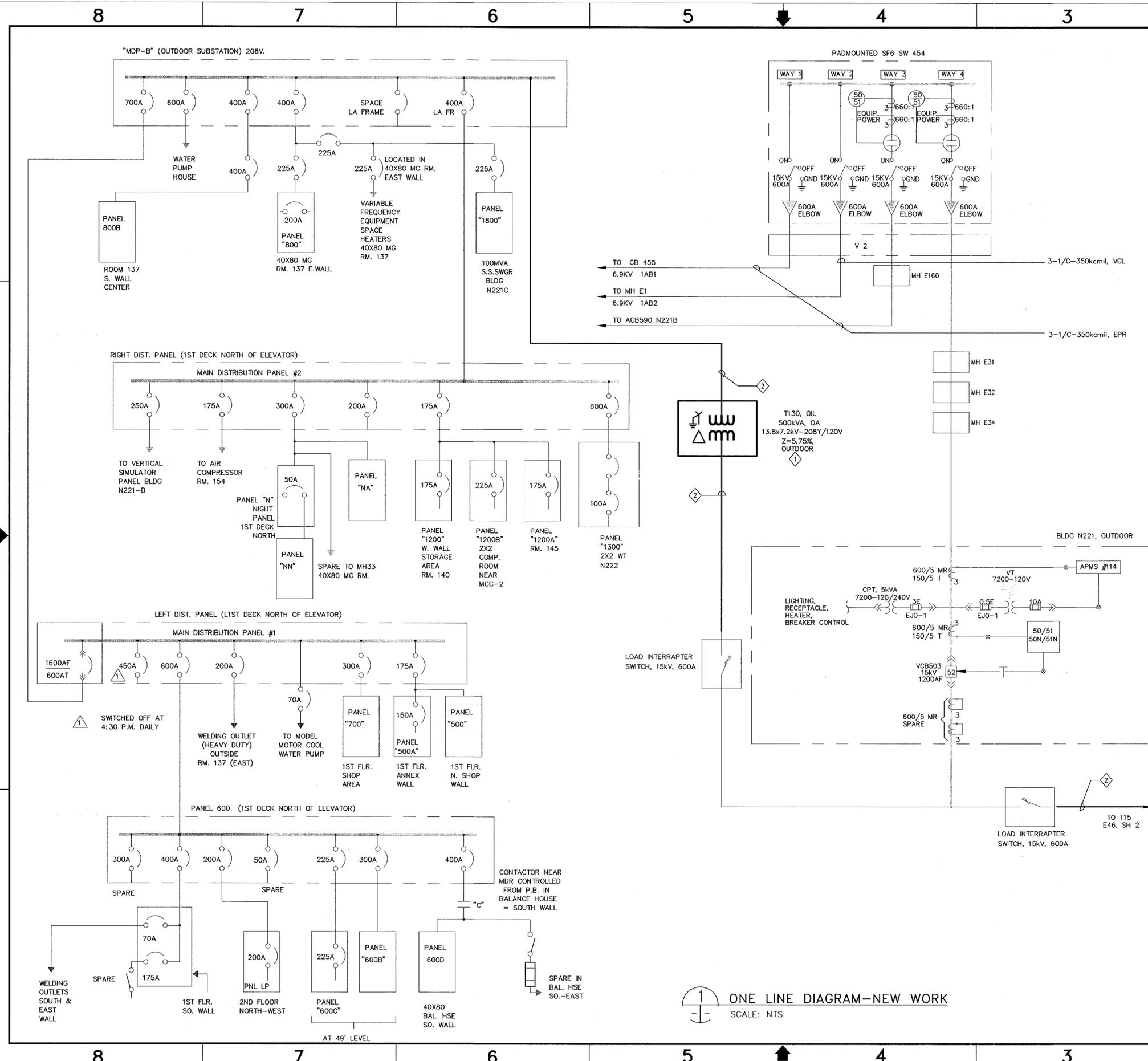
RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII
N221 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

**ONE LINE DIAGRAM
NEW WORK**

SIZE D	CAGE CODE 25307
SCALE AS NOTED	INDEX
SHEET 1 OF 2	

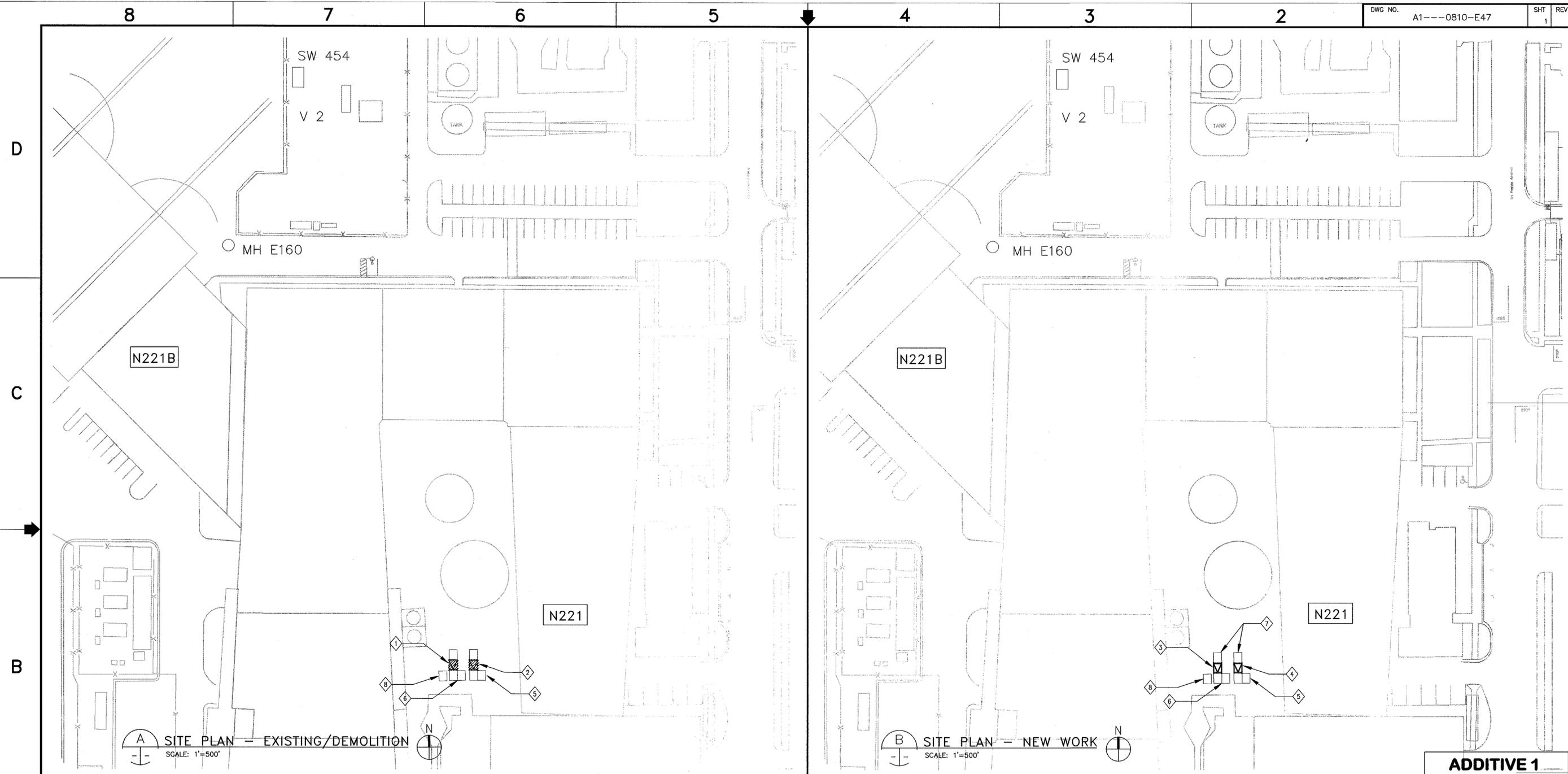
FILE NAME:
A1---0810-E046_I_R8.DWG 4-30-09

ONE LINE DIAGRAM-NEW WORK
SCALE: NTS



DWG: \\F119-113\cadd\ARC\BDS\BDS\Phase VII\500_CAD\N221_Outdoor_Substation_Upgrade - T15 and T130\Sheet\A1---0810-E046_I_R8.DWG
 DATE: Apr 29, 2009 9:23:29 am
 Version: 17.1s (LMS Tech) User: pdiden

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ADDITIVE 1

SHEET NOTES

1. NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON THE DRAWING.
2. HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED, U.O.N.
3. CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS AT THE SITE AND SHALL BE RESPONSIBLE FOR THEIR ACCURACY PRIOR TO STARTING ANY WORK OR ORDERING ANY MATERIAL.

KEY NOTES

- 1 REMOVE EXISTING TRANSFORMER T130 AND ALL ASSOCIATED EQUIPMENT AND DEVICES, SEE DRAWING E48 FOR LAYOUT.
- 2 REMOVE EXISTING TRANSFORMER T15 AND ALL ASSOCIATED EQUIPMENT AND DEVICES, SEE DRAWING E48 FOR LAYOUT.
- 3 PROVIDE NEW OUTDOOR LIQUID-FILLED 500kVA TRANSFORMER T130 WITH DUAL RATED PRIMARY WINDING, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40. SEE DRAWING E49 FOR LAYOUT.
- 4 PROVIDE NEW OUTDOOR LIQUID-FILLED 1000kVA TRANSFORMER T15 WITH DUAL RATED PRIMARY WINDING, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40. SEE DRAWING E49 FOR LAYOUT.
- 5 (E) 480Y/277V DISTRIBUTION SWITCHBOARD TO REMAIN.
- 6 (E) 208Y/120V DISTRIBUTION SWITCHBOARD TO REMAIN.
- 7 (E) 15kV, 600A LOAD INTERRUPTER SWITCH TO REMAIN.
- 8 (E) 15kV CIRCUIT BREAKER SWITCHGEAR ACB503 TO REMAIN.

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DRAWN	N.NIZAMOVA	DATE	4/30/09		
DESIGNED	N.NIZAMOVA	DATE	4/30/09		
CHECKED	J.McCUSKER	DATE	4/30/09		
PROJ.MGR	N.NIZAMOVA	DATE	4/30/09		
REQUESTER	N.HSU	DATE	4/29/09		
R&QA		DATE			
SAFETY		DATE			
SUPERVISOR	S.FRANKEL	DATE	5-7-09		

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM—PHASE VIII
N221 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

SITE PLANS
EXISTING/DEMOLITION & NEW WORK

SIZE D CAGE CODE 25307
SCALE: 1"=500'

INDEX SHEET 1 OF 1

FILE NAME: A1---0810-047_L_R8.DWG 4-30-09

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 DATE: Apr 29, 2009 - 9:23:37 am

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DWG NO. A1---0810-E48

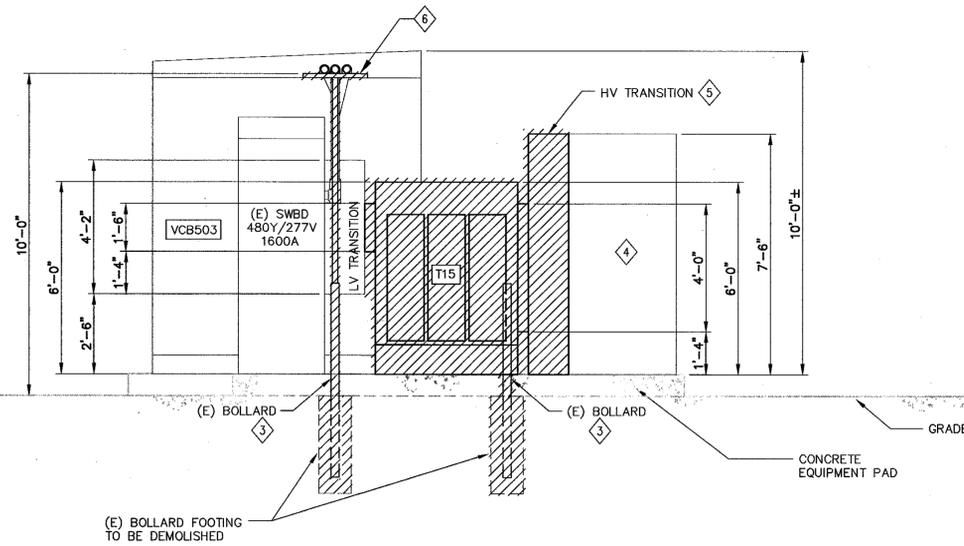
SHT REV

SHEET NOTES

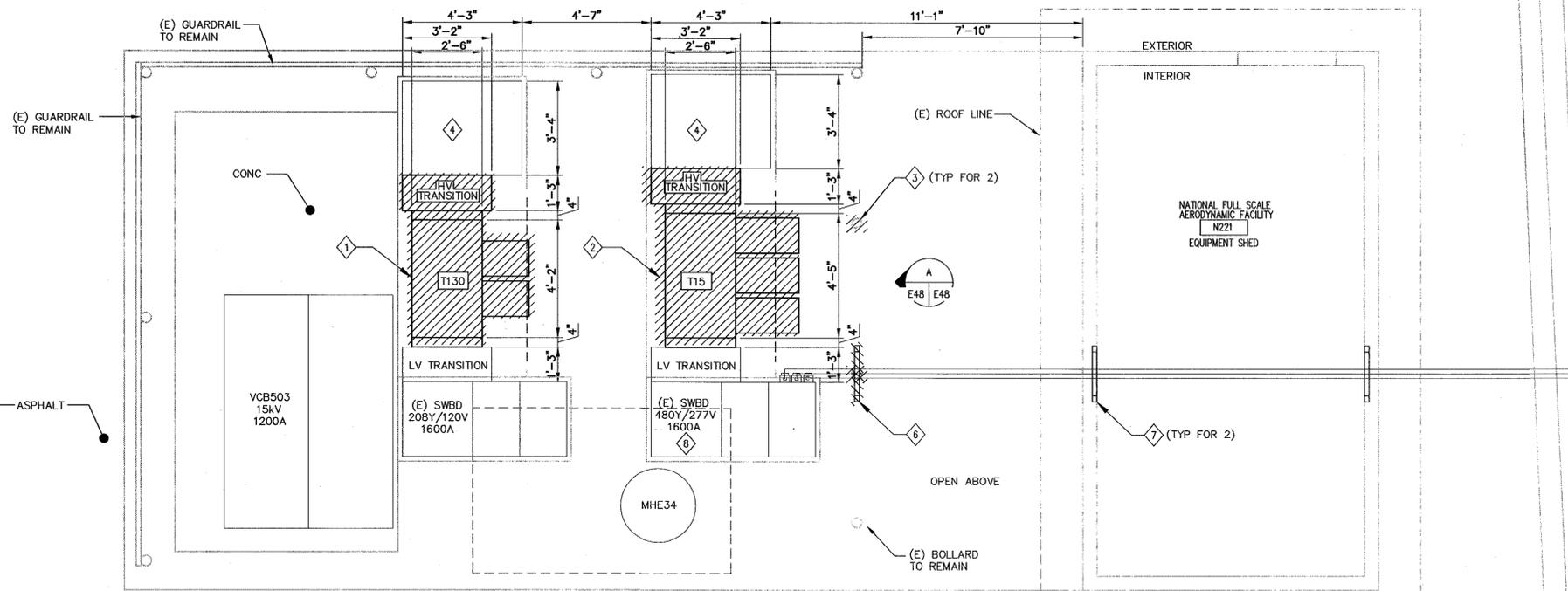
- FOR GENERAL CONSTRUCTION NOTES, SYMBOLS AND ABBREVIATIONS SEE DRAWING G4.
- HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED U.O.N.
- CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS AT THE SITE AND SHALL BE RESPONSIBLE FOR THEIR ACCURACY PRIOR TO STARTING ANY WORK OR ORDERING ANY MATERIAL.
- ALL EXISTING CONDUITS AND CONDUCTORS SHALL BE DISCONNECTED FROM (E) EQUIPMENT AND RECONNECTED TO NEW EQUIPMENT, CONTRACTOR SHALL DETERMINE IN FIELD AND PROVIDE PULL BOXES AND RELOCATE/EXTEND OR REPLACE (E) CONDUITS AND CONDUCTORS (MATCH EXISTING SIZE) TO COMPLETE CONNECTIONS TO NEW AND EXISTING EQUIPMENT.
- EXISTING GROUNDING SYSTEM TO REMAIN FOR RECONNECTION IN NEW WORK.
- PRIOR TO SHUTDOWN AND DEMOLITION WORK, CONTRACTOR SHALL PERFORM PHASE SEQUENCE TEST ON EXISTING SYSTEM/EQUIPMENT IN THE PRESENCE OF COTR.

KEY NOTES

- REMOVE EXISTING TRANSFORMER T130 AND ALL ASSOCIATED EQUIPMENT AND DEVICES. SEE DRAWING E45 FOR ONE LINE DIAGRAM.
- REMOVE EXISTING TRANSFORMER T15 AND ALL ASSOCIATED EQUIPMENT AND DEVICES. SEE DRAWING E45 FOR ONE LINE DIAGRAM.
- REMOVE EXISTING BOLLARDS AS SHOWN ON THE DRAWING TO ACCOMMODATE DEMOLITION WORK AND INSTALLATION OF NEW EQUIPMENT.
- EXISTING 15KV, 600A LOAD INTERRUPTER FUSED SWITCH TO REMAIN.
- EXISTING MV TRANSITION SECTION SHALL BE DEMOLISHED AND REPLACED WITH NEW ONE IN NEW CONSTRUCTION.
- EXISTING METAL CONDUIT SUPPORT TO BE DEMOLISHED.
- EXISTING METAL CONDUIT SUPPORT TO REMAIN.
- REMOVE (E) 1600A MAIN CIRCUIT BREAKER.



EQUIPMENT ELEVATION - EXISTING/DEMOLITION
SCALE: 3/8"=1'-0"



EQUIPMENT PLAN - EXISTING/DEMOLITION
SCALE: 3/8"=1'-0"

ADDITIVE 1

Approved for Construction
Moffett Field Permit Board

[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	N.NIZAMOVA	DATE	05.11.09
DESIGNED	N.NIZAMOVA	DATE	05.11.09
CHECKED	J.MCJUSKER	DATE	05.11.09
PROJ/MGR	N.NIZAMOVA	DATE	05.11.09
REQUESTER	N.HSU	DATE	05.11.09
R&QA		DATE	
SAFETY		DATE	
SUPERVISOR	S.FRANKEL	DATE	4/11/09

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N221 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

**EQUIPMENT PLAN AND ELEVATION
EXISTING/DEMOLITION**

SIZE	D	CAGE CODE	25307	REV	
SCALE	AS NOTED	INDEX		SHEET	OF

FILE NAME:
A1---0810-E048_1_R8.DWG 03-15-09

DWG: P:\ARC\ARC\REDS\REDS Phase VIII\500_CAD\N221_Outdoor Substation Upgrade - T15 and T130\A1---0810-E048_1_R8.DWG Version: 17.1s (LMS Tech) User: cywong
DATE: May 11, 2009 11:47:27 am

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DWG NO. A1---0810-E49

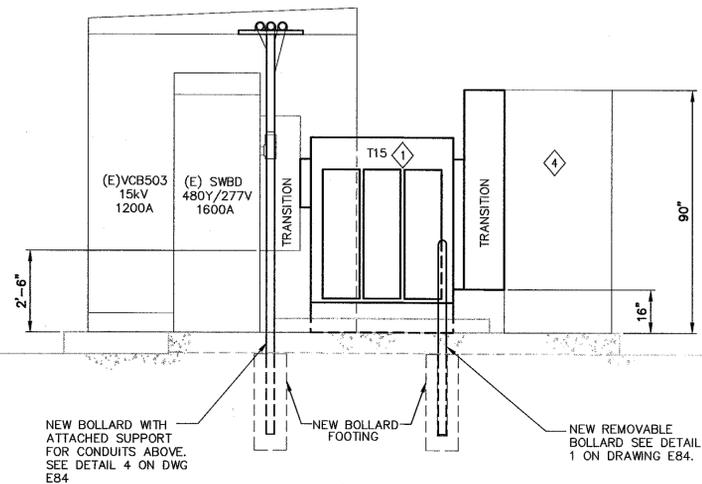
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SHEET NOTES

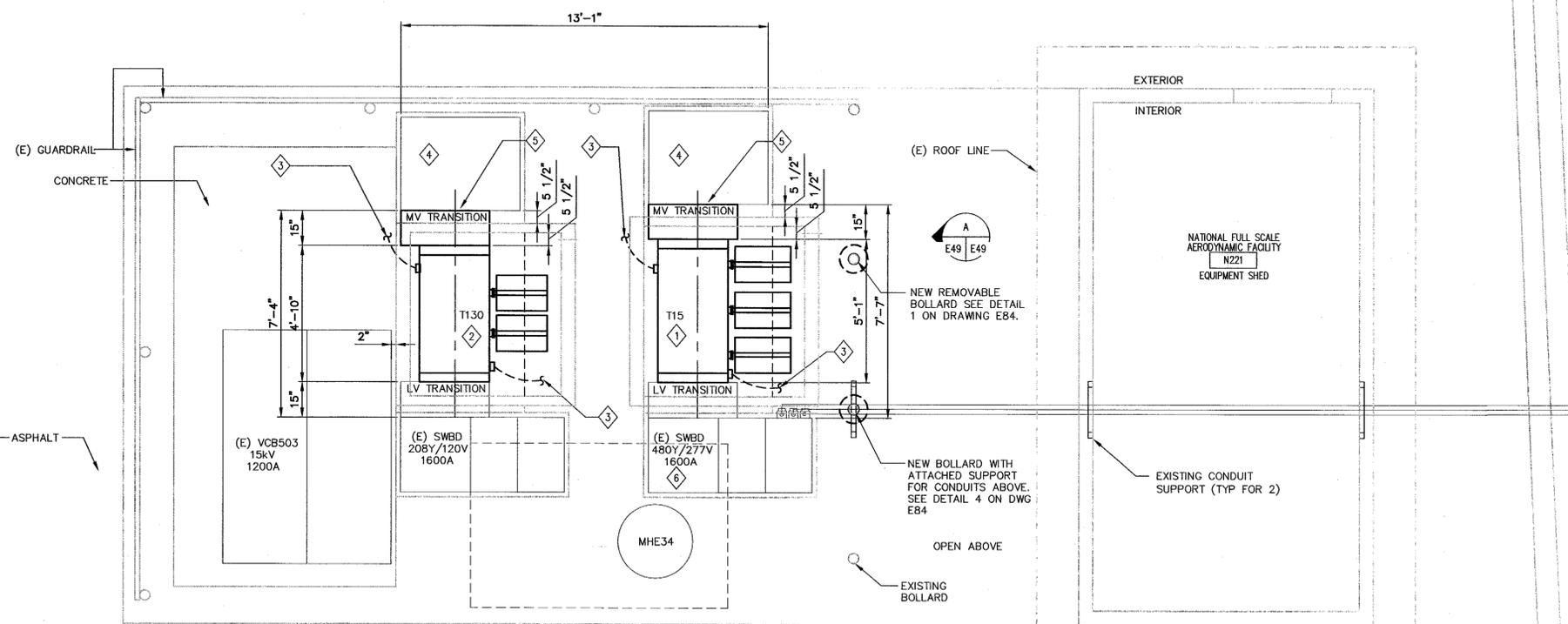
- 1. FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4.
- 2. LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
- 3. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- 4. CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.
- 5. ALL EXISTING CONDUITS AND CONDUCTORS SHALL BE RECONNECTED TO NEW EQUIPMENT, CONTRACTOR SHALL DETERMINE IN FIELD AND PROVIDE PULL BOXES AND RELOCATE/EXTEND OR REPLACE (E) CONDUITS AND CONDUCTORS (MATCH EXISTING SIZE) TO COMPLETE CONNECTIONS TO NEW AND EXISTING EQUIPMENT.
- 6. SEE STRUCTURAL DRAWINGS S5, S8 & S9 FOR CONCRETE PAD DETAILS.

KEY NOTES

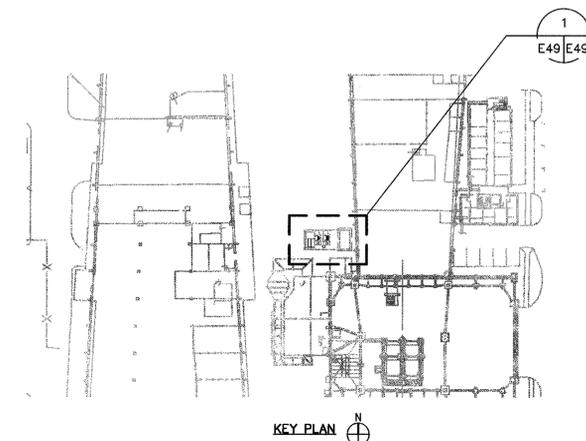
- 1 PROVIDE NEW OUTDOOR LIQUID-FILLED 1000KVA TRANSFORMER T15 WITH DUAL RATED PRIMARY WINDING, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- 2 PROVIDE NEW OUTDOOR LIQUID-FILLED 500KVA TRANSFORMER T130 WITH DUAL RATED PRIMARY WINDING, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- 3 CONNECT NEW EQUIPMENT TO EXISTING GROUNDING SYSTEM WITH #4/0 BARE COPPER GROUND CONDUCTOR.
- 4 EXISTING 15KV, 600A LOAD INTERRUPTER SWITCH.
- 5 PROVIDE NEW 15" WIDE MV TRANSITION SECTION. INSTALL 16" ABOVE THE (E) CONCRETE PAD. CONNECT TO (E) SWITCH ENCLOSURE.
- 6 PROVIDE 1600A DRAW OUT TYPE POWER MAIN CIRCUIT BREAKER WITH LSIG SETTINGS.



A EQUIPMENT ELEVATION - NEW WORK
E49 E49 SCALE: 3/8"=1'-0"



1 EQUIPMENT PLAN - NEW WORK
SCALE: 3/8"=1'-0"



ADDITIVE 1

Approved for Construction
Moffett Field Permit Board

Nita Loh
Chief Building Official

Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN N.NIZAMOVA	DATE 05.11.09
DESIGNED N.NIZAMOVA	DATE 05.11.09
CHECKED J.MCCLUSKER	DATE 05.11.09
PROJNGR N.NIZAMOVA	DATE 05.11.09
REQUESTER N.HSU	DATE 05.11.09
R&QA	DATE

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N221 OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

EQUIPMENT PLAN AND ELEVATION
NEW WORK

SUPERVISOR S.FRANKEL	DATE 5/11/09
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SIZE D	CAGE CODE 25307	INDEX A	SHEET 1	OF 1
SCALE: AS NOTED		FILE NAME: A1---0810-E49_1_R8.DWG 03-15-09		

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A1---0810-E49_1_R8.DWG 03-15-09

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DATE: May 11, 2009 - 11:47:33 am

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DWG NO. A1---0810-E50

SHT 1 REV -

SHEET NOTES

- 1. FOR GENERAL CONSTRUCTION NOTES, SYMBOLS & ABBREVIATIONS SEE DRAWING G4.
- 2. HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED/REMOVED, U.O.N.
- 3. PRIOR TO SHUTDOWN AND DEMOLITION WORK, CONTRACTOR SHALL PERFORM PHASE SEQUENCE TEST ON EXISTING SYSTEM/EQUIPMENT IN THE PRESENCE OF COTR.
- 4. ALL DISCONNECTED CABLES/EQUIPMENT SHALL BE PROPERLY IDENTIFIED, TAGGED/LABELLED FOR RESTORATION IN NEW WORK.

KEY NOTES

- 1 REMOVE EXISTING TRANSFORMER T130 AND ALL ASSOCIATED EQUIPMENT AND DEVICES, SEE DRAWING E48 FOR LAYOUT AND DRAWING E45 FOR ONE LINE DIAGRAM.
- 2 REMOVE EXISTING TRANSFORMER T15 AND ALL ASSOCIATED EQUIPMENT AND DEVICES, SEE DRAWING E48 FOR LAYOUT AND DRAWING E45 FOR ONE LINE DIAGRAM.
- 3 (E) 480Y/277V DISTRIBUTION SWITCHBOARD TO REMAIN. REMOVE (E) 1600A MAIN CIRCUIT BREAKER.
- 4 (E) 208Y/120V DISTRIBUTION SWITCHBOARD TO REMAIN.
- 5 (E) 15kV CIRCUIT BREAKER SWITCHGEAR ACB503 TO REMAIN.
- 6 (E) GUARDRAIL TO REMAIN. SEE DRAWINGS E48 & E49 FOR EXISTING AND NEW EQUIPMENT LAYOUTS.
- 7 (E) TRANSITION SECTION SHALL BE REMOVED.
- 8 REMOVE (E) BOLLARD IN ORDER TO ACCOMMODATE DEMOLITION AND NEW INSTALLATION. PROVIDE TEMPORARY SUPPORT FOR EXISTING CONDUITS DURING CONSTRUCTION.
- 9 (E) 15kV, 600A LOAD INTERRUPTER SWITCH TO REMAIN.
- 10 (E) BOLLARD TO BE DEMOLISHED.

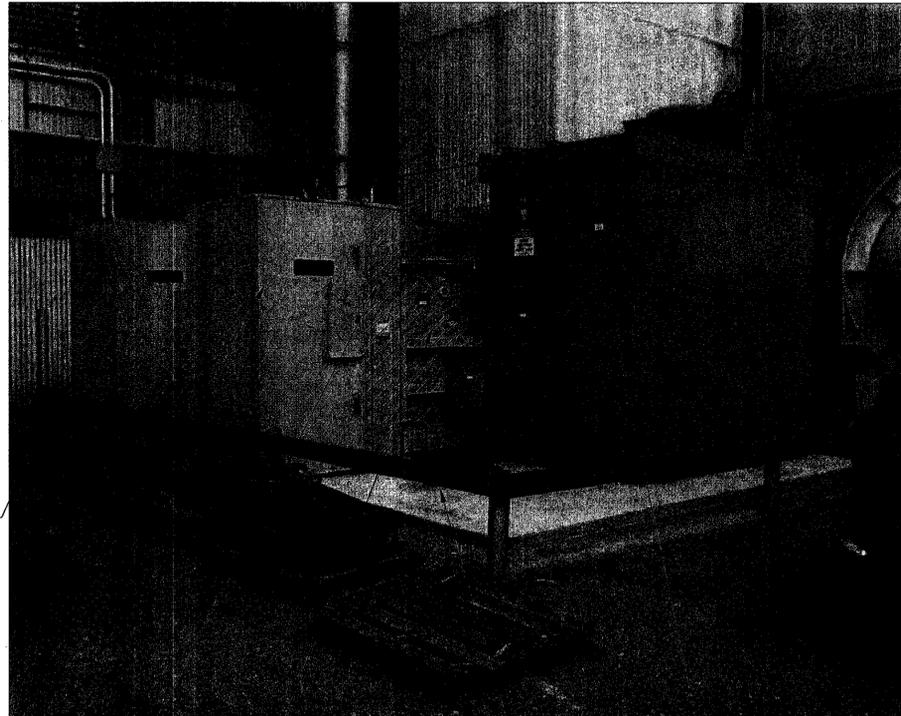
ADDITIVE 1

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

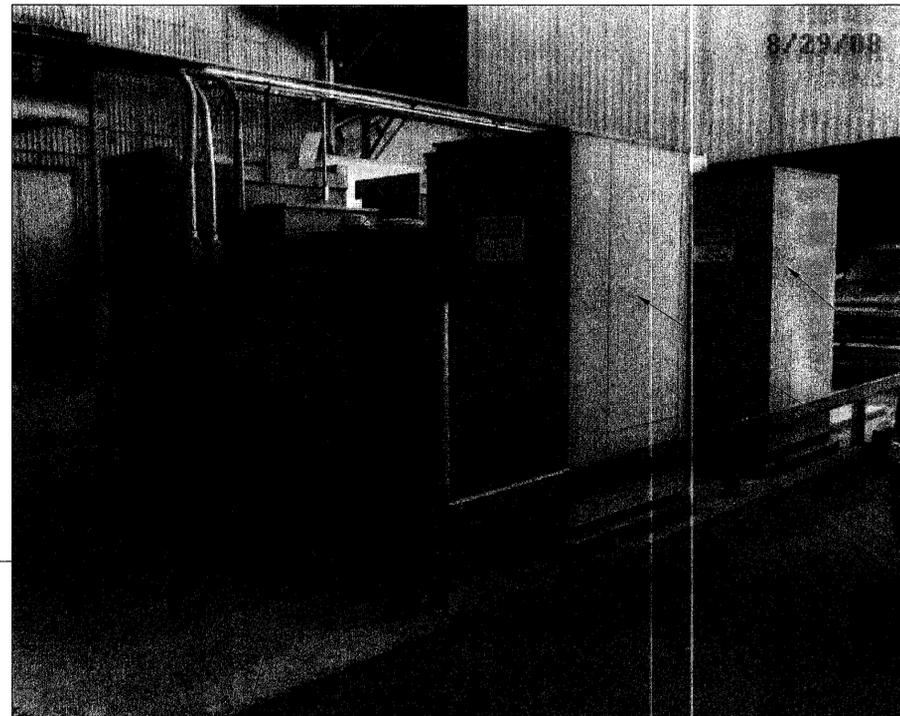
ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN N.NIZAMOVA	DATE 05.11.09	 Ames Research Center Moffett Field, California RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII N221 OUTDOOR SUBSTATION UPGRADE ELECTRICAL PHOTO DETAILS EXISTING/DEMOLITION
DESIGNED N.NIZAMOVA	DATE 05.11.09	
CHECKED J.MCCUSKER	DATE 05.11.09	
PROJ.MGR N.NIZAMOVA	DATE 05.11.09	
REQUESTER N.HSU	DATE 05.11.09	
R&Q	DATE	
SAFETY	DATE	
SUPERVISOR S.FRANKEL	DATE 4/1/09	
SIZE D	CAGE CODE 25307	
SCALE: AS NOTED	INDEX	

FILE NAME: A1---0810-E050_1_R8.DWG	03-04-09
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1 (E) N221 SUBSTATION DETAIL
E48 E50 SCALE:



2 (E) N221 SUBSTATION DETAIL
E48 E50 SCALE:



3 (E) N221 SUBSTATION DETAIL
E48 E50 SCALE:

DWG: P:\VBC\ARC\BENS\Phase VIII\500_CAD\N221_Outdoor Substation Upgrade - T15 and T130\E\Sheet\A1---0810-E050_1_R8.DWG User: oymng
 Version: 17.1s (LMS Tech)
 DATE: May 11, 2009 - 11:47:18 am

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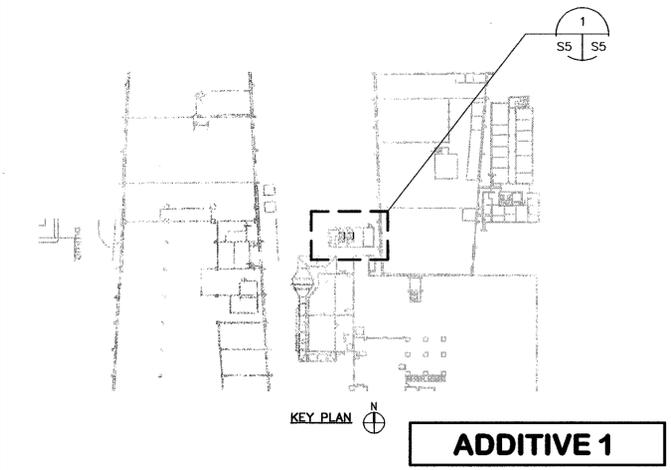
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 Version: 17.1.s (LMS Tech) User: polden
 DATE: Apr 29, 2009 - 9:24:17 am

SHEET NOTES

1. FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4 AND S1.
2. LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
3. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
4. CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.

KEY NOTES

- 1 1/2"Ø HILTI HIT RE-500-SD ADHESIVE ANCHOR W/MIN 6" EMBEDMENT, 4 PER CABINET OR TRANSFORMER.
- 2 (N) CONC PAD.
- 3 NOT USED.
- 4 (E) RAISED CONC PAD TO REMAIN.
- 5 REMOVABLE BOLLARD. SEE SHEET E84.
- 6 FIXED BOLLARD W/ METAL SUPPORT. SEE SHEET E84.
- 7 (E) ROOFLINE, ABOVE.



ADDITIVE 1

Approved for Construction
 Moffett Field Permit Board
[Signature]
 Chief Building Official
 Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN E. ALDEN	DATE 4/30/09
DESIGNED A. FIROUZI	DATE 4/29/09
CHECKED M. CUSTER	DATE 4/30/09
PROJ MGR N. NIZAMOVA	DATE 4/30/09
REQUESTER N. HSU	DATE 4/29/09
R&QA	DATE
SAFETY	DATE
SUPERVISOR S. FRANKEL	DATE 5/5/09

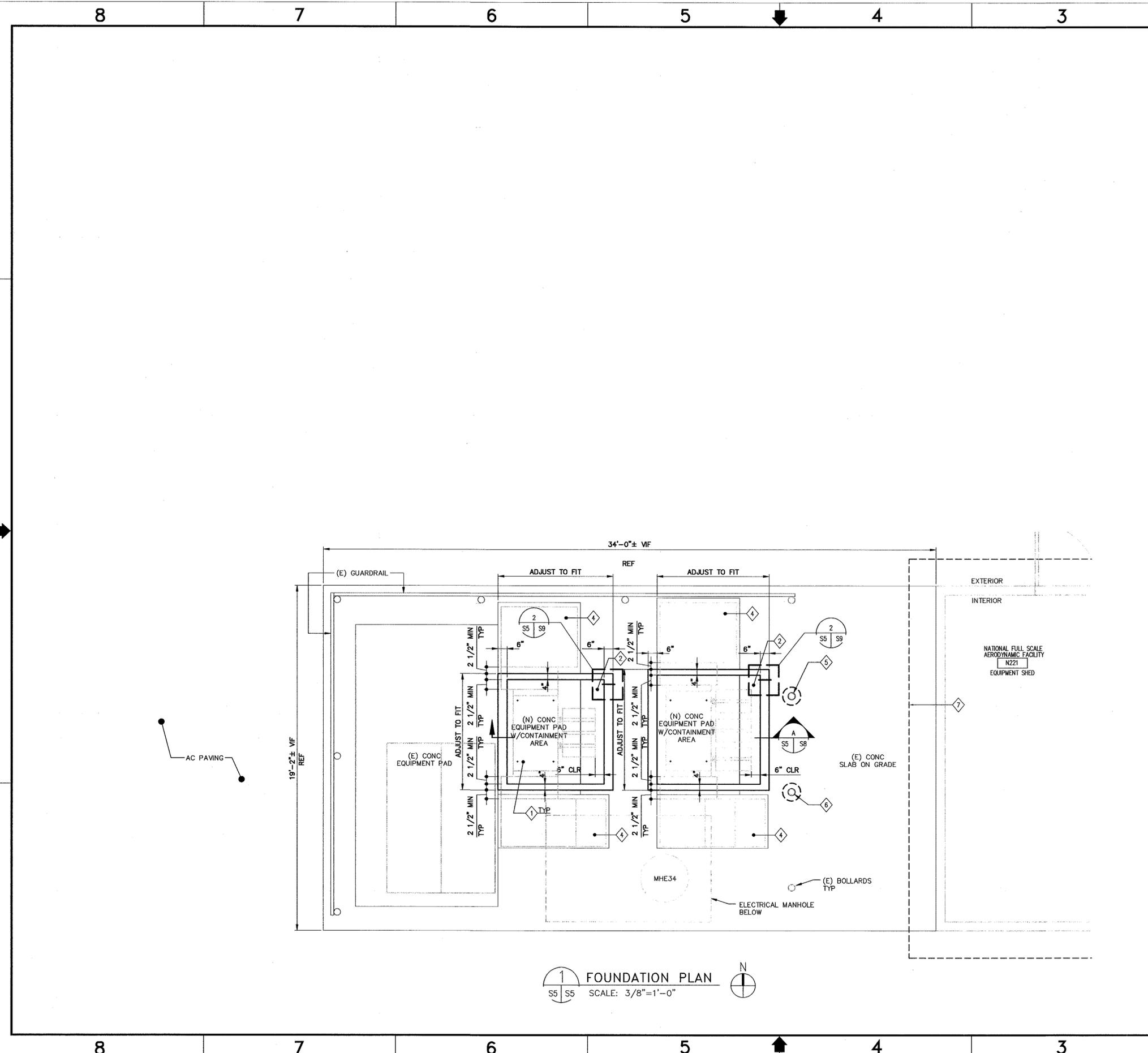
Ames Research Center
 Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII
 N221 OUTDOOR SUBSTATION UPGRADE
 STRUCTURAL

FOUNDATION PLAN

SIZE D	CAGE CODE 25307	SCALE AS NOTED	INDEX	SHEET OF
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FILE NAME:
 A1---0810-S005_L_R8.DWG 4-30-09



1 FOUNDATION PLAN
 SCALE: 3/8"=1'-0"

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DWG NO. A1---0810-E55

SHT 1 REV

SHEET NOTES

- FOR GENERAL CONSTRUCTION NOTES, SYMBOLS AND ABBREVIATIONS SEE DRAWING G4.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON THE DRAWING.
- SINGLE LINE DIAGRAM IS BASED ON THE LATEST KNOWN EXISTING NASA DRAWING.
- HATCHED LINES INDICATE EXISTING MATERIAL AND EQUIPMENT TO BE DEMOLISHED/REMOVED, U.O.N.
- PRIOR TO SHUTDOWN AND DEMOLITION WORK, CONTRACTOR SHALL PERFORM PHASE SEQUENCE TEST ON EXISTING SYSTEM/EQUIPMENT IN THE PRESENCE OF COTR. ALL DISCONNECTED CABLES/EQUIPMENT SHALL BE PROPERLY IDENTIFIED, TAGGED/LABELLED FOR RESTORATION IN NEW WORK.
- SEE DRAWING E56 FOR ONE LINE DIAGRAM-NEW WORK.

KEY NOTES

- DISCONNECT AND REMOVE EXISTING INCOMING CABLE FROM SW 454 TO ACB590.
- REMOVE EXISTING 15KV PRIMARY SWITCHGEAR AND CIRCUIT BREAKER ACB590 AND ALL ASSOCIATED EQUIPMENT AND DEVICES.
- REMOVE CONNECTION BETWEEN ACB590 AND TRANSFORMER T172.
- REMOVE CONNECTION BETWEEN ACB590 AND TRANSFORMER T173.
- REMOVE EXISTING TRANSFORMER T172 AND ALL ASSOCIATED EQUIPMENT AND DEVICES, SEE DRAWING E58 FOR LAYOUT.
- REMOVE EXISTING TRANSFORMER T173 AND ALL ASSOCIATED EQUIPMENT AND DEVICES. SEE DRAWING E58 FOR LAYOUT.
- REMOVE CONNECTION BETWEEN TRANSFORMER T172 AND LV SWBD.
- REMOVE CONNECTION BETWEEN TRANSFORMER T173 AND LV MAIN DISTRIBUTION SWITCHBOARD.
- REMOVE EXISTING LV DISTRIBUTION SWITCHBOARD.
- DISCONNECT AND PULL BACK (E) CONDUCTORS. PROTECT FOR RECONNECTION IN (N) WORK. SEE E56 KEY NOTE 9.

REFERENCE DRAWINGS

- A1---6303-E0 BLDG INDEX, CROSS-REF, LEGEND & ABBR.
- A1---5805-E30 SYSTEM A & B SINGLE LINE DIAGRAM
- A1---6303-E13 40X80 WT SINGLE LINE DIAGRAM
- A221B-8182-E571 UNIT SUB #3 WIRING DIAGRAM
- A221B-8182-E81 UNIT SUB #3 ELEMENTARY DIAGRAM
- A221B-8182-E82 UNIT SUB #3 ELEMENTARY DIAGRAM

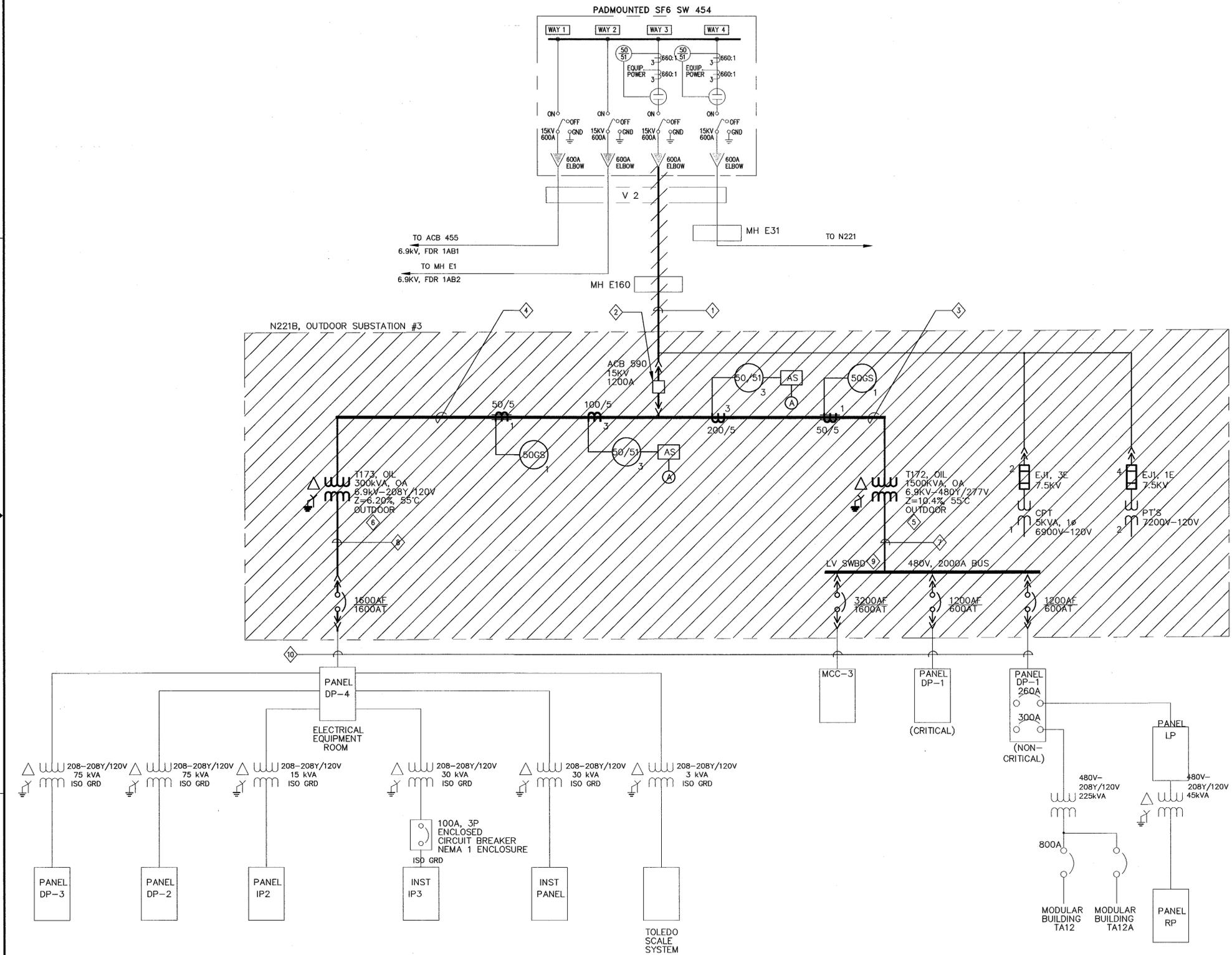
ADDITIVE 2

Approved for Construction
Moffett Field Permit Board
Mits blue
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN N.NIZAMOVA DESIGNED N.NIZAMOVA CHECKED J.MCCLUSKER PROJECTOR N.NIZAMOVA REQUESTER N.HSU R&QA DATE 4/30/09 DATE 4/30/09 DATE 4/30/09 DATE 4/30/09 DATE 4/30/09	DATE 4/30/09 DATE 4/30/09 DATE 4/30/09 DATE 4/30/09 DATE 4/30/09	Ames Research Center Moffett Field, California RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII N221B OUTDOOR SUBSTATION UPGRADE ELECTRICAL ONE LINE DIAGRAM EXISTING/DEMOLITION	SUPERVISOR S.FRANKEL DATE 5/15/09 DATE	SIZE D SCALE: AS NOTED	PAGE CODE 25307 INDEX SHEET 1 OF 1	FILE NAME: A1---0810-E055_1_RB.DWG 4-30-09
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ONE LINE DIAGRAM-EXISTING/DEMOLITION
SCALE: NTS



DWG: \\f19-a13\cadd\ARC\ARC REDS\REDS Phase VIII_500_CAD\N221B_Outdoor Substation Upgrade - T172 and T173\Sheet\A1---0810-E055_1_RB.DWG Version: 17.1s (LMS Tech) User: padlen
 DATE: Apr 29, 2009 - 9:24:23 am

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SHEET NOTES

- FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4.
- LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON DWG.
- DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- THE DIAGRAM IS PROVIDED FOR GUIDANCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT INCLUDING TERMINAL BLOCKS, TERMINAL IDENTIFICATION NUMBER, CONNECTIONS ETC. AND REVISE DRAWINGS AS NEEDED TO MATCH EXISTING AND NEW EQUIPMENT TO PROVIDE A COMPLETE FUNCTIONAL SYSTEM.
- ALL CT WIRES SHALL BE #10 AWG MINIMUM, TYPE SIS.
- ALL VOLTAGE, OPT SECONDARY AND BREAKER TRIP WIRES SHALL BE #12 AWG MINIMUM, TYPE SIS. U.O.N.
- CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.
- CPT AND VT'S SHALL BE DRAWOUT TYPE.
- SEE DRAWING E62 FOR THREE LINE DIAGRAM AND E63 FOR BREAKER CONTROL DIAGRAM. SEE DRAWING E80 FOR NAMEPLATE SCHEDULE.

KEY NOTES

- 1. PROVIDE NEW OUTDOOR LIQUID-FILLED 1500KVA TRANSFORMER T172 WITH DUAL RATED PRIMARY WINDING, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- 2. PROVIDE NEW OUTDOOR LIQUID-FILLED 300KVA TRANSFORMER T173 WITH DUAL RATED PRIMARY WINDING, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- 3. PROVIDE OUTDOOR 480Y/277V SWBD-1 WITH 2500A MAIN CIRCUIT BREAKER DRAW OUT TYPE WITH GFP AND THREE FEEDER CIRCUIT BREAKERS DRAW OUT TYPE WITH GFP.
- 4. PROVIDE 15KV, 3-1/C-350KCMIL, 133% INSULATION, EPR CABLE AND 1/C #4 GND FROM SW454 TO VCB590 VIA VAULT #2 & MH E160.
- 5. PROVIDE 15KV, 1200A VACUUM CIRCUIT BREAKER SWITCHGEAR VCB590 AND VCB752 INCLUDING CPT, VT AND ALL ACCESSORIES PER SPECIFICATION SECTION 26 13 00.00 20.
- 6. INSTALL GFE 3-PHASE MICROPROCESSOR BASED RELAY ALSTOM MICOM P124 COMPLETELY WIRED ON THE NEW SWITCHGEAR. INSTALLATION SHALL BE IN ACCORDANCE WITH DRAWINGS E81 & E85.
- 7. INSTALL GFE 3-PHASE DIGITAL POWER METER, PML ION 7330 COMPLETELY WIRED TO THE NEW SWITCHGEAR. INSTALLATION SHALL BE IN ACCORDANCE WITH DRAWING E85. SEE KEY NOTE ON DRAWING E59 FOR CONNECTION DETAILS.
- 8. PROVIDE OUTDOOR 208Y/120V SWBD-2 WITH 1200A DRAW OUT TYPE CIRCUIT BREAKER WITH GFP.
- 9. RECONNECT EXISTING CONDUITS AND CONDUCTORS TO NEW EQUIPMENT. CONTRACTOR SHALL DETERMINE IN FIELD AND PROVIDE PULL BOXES AND RELOCATE, EXTEND OR REPLACE (E) CONDUITS AND CONDUCTORS (MATCH EXISTING SIZE) TO COMPLETE CONNECTIONS TO NEW AND EXISTING EQUIPMENT.

ADDITIVE 2

Approved for Construction
Moffett Field Permit Board
Nitzsche
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

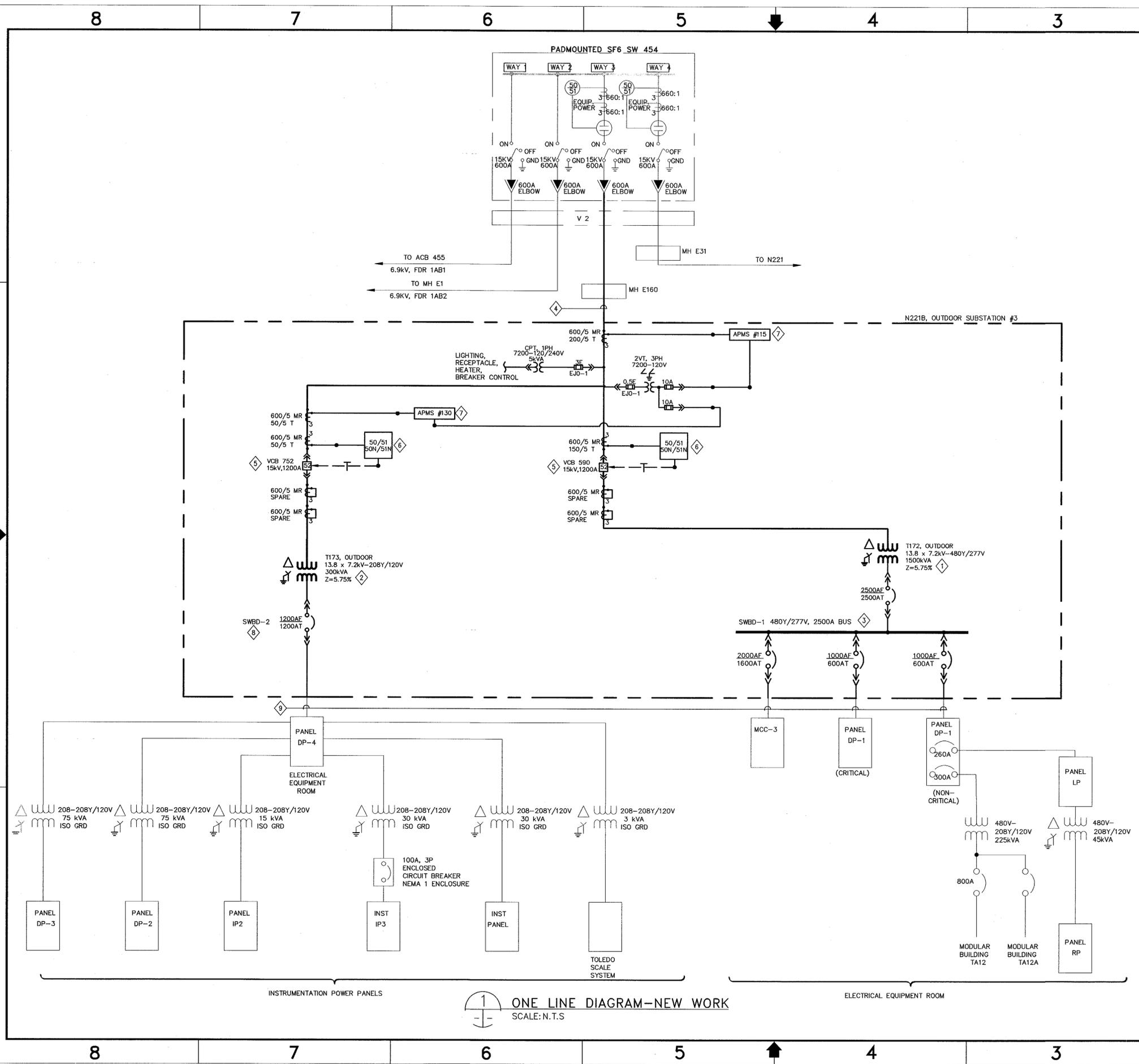
DESIGNED N.NIZAMOVA	DATE 4.30.09
CHECKED J.McCUSKER	DATE 4.30.09
PROJENR N.NIZAMOVA	DATE 4.30.09
REQUESTER N.HSU	DATE 4/30/09
R&QA	DATE
SAFETY	DATE
SUPERVISOR S.FRANKEL	DATE 5-1-09

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM--PHASE VIII
N221B OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

ONE LINE DIAGRAM
NEW WORK

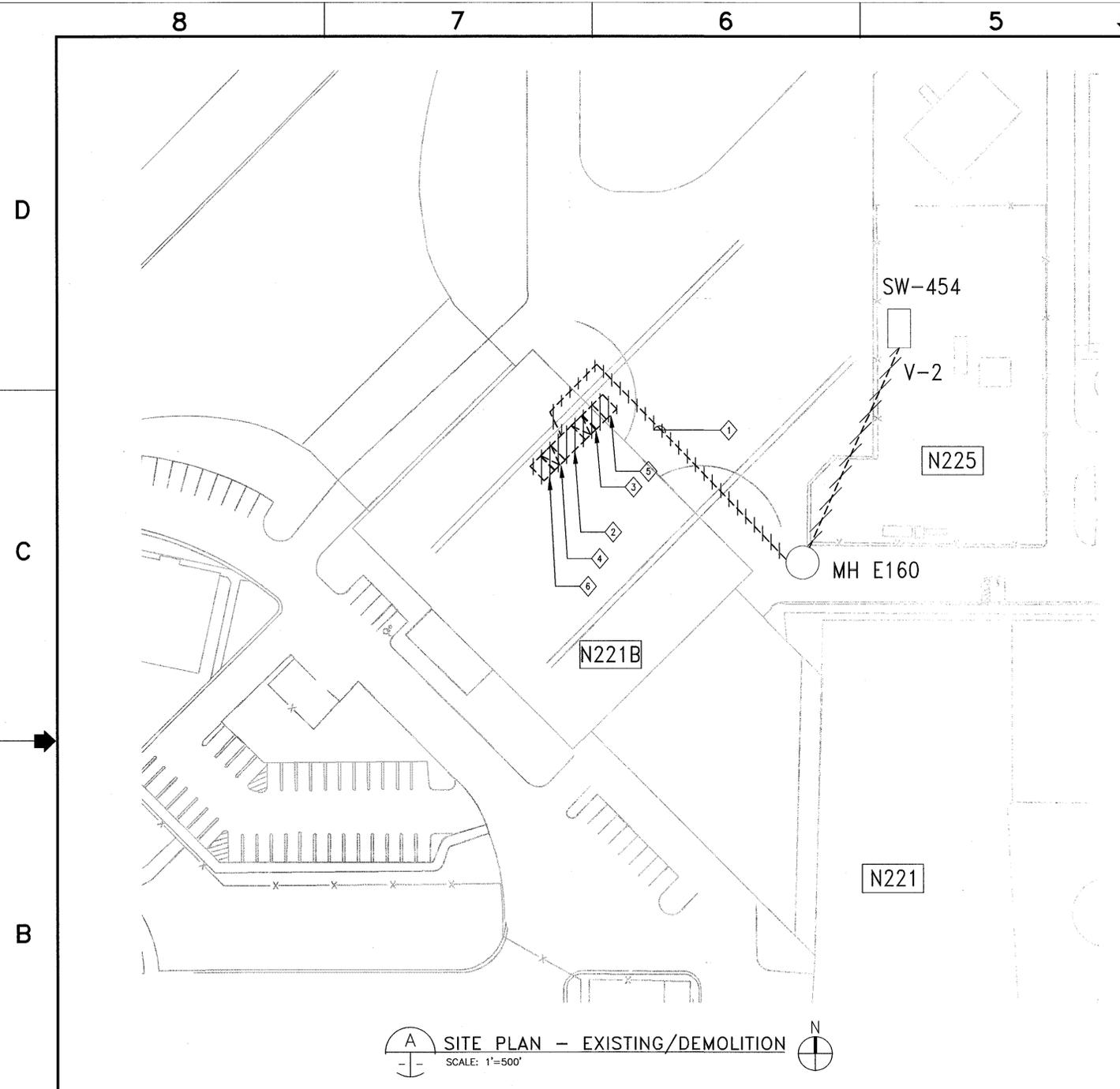
SIZE D	CAGE CODE 25307	REV 1
SCALE: AS NOTED	INDEX	SHEET 1 OF 1



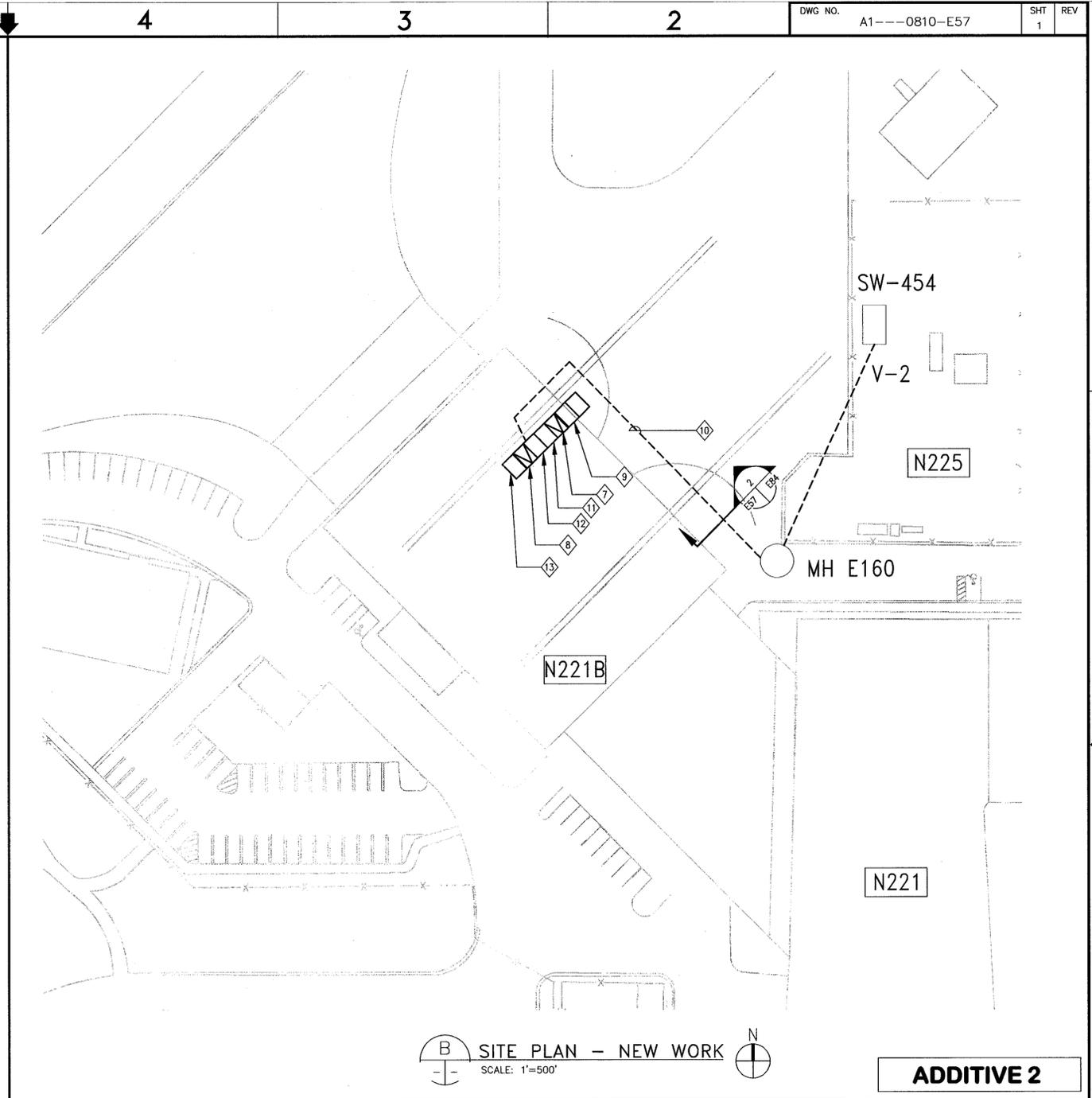
ONE LINE DIAGRAM-NEW WORK
SCALE: N.T.S.

DWG: \\fer19-m3\cadd\ARC\REDS\Phase VIII\500_CAD\N221B_Outdoor_Substation_Upgrade - T172 and T173\Sheet\A1---0810-E56_1_R8.DWG Version: 17.1.s User: palden
 DATE: Apr 29, 2009 9:24:26 am

60048720.0001



A SITE PLAN - EXISTING/DEMOLITION
SCALE: 1"=500'



B SITE PLAN - NEW WORK
SCALE: 1"=500'

ADDITIVE 2

SHEET NOTES

1. NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON THE DRAWING.
2. HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED, U.O.M.
3. CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS AT THE SITE AND SHALL BE RESPONSIBLE FOR THEIR ACCURACY PRIOR TO STARTING ANY WORK OR ORDERING ANY MATERIAL.

KEY NOTES

- 1 DISCONNECT AND REMOVE EXISTING INCOMING CABLE FROM SW 454 TO ACB590.
- 2 REMOVE EXISTING 15KV PRIMARY SWITCHGEAR AND CIRCUIT BREAKER ACB590 AND ALL ASSOCIATED EQUIPMENT AND DEVICES.
- 3 REMOVE EXISTING TRANSFORMER T172 AND ALL ASSOCIATED EQUIPMENT AND DEVICES. SEE DRAWING E58 FOR LAYOUT.
- 4 REMOVE EXISTING TRANSFORMER T173 AND ALL ASSOCIATED EQUIPMENT AND DEVICES. SEE DRAWING E58 FOR LAYOUT.
- 5 REMOVE EXISTING 480Y/277V DISTRIBUTION SWITCHBOARD.
- 6 REMOVE EXISTING 208Y/120V DISTRIBUTION SWITCHBOARD.
- 7 PROVIDE NEW OUTDOOR LIQUID-FILLED 1500kVA TRANSFORMER T172 WITH DUAL RATED PRIMARY WINDING, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- 8 PROVIDE NEW OUTDOOR LIQUID-FILLED 300kVA TRANSFORMER T173 WITH DUAL RATED PRIMARY WINDING, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- 9 PROVIDE OUTDOOR 480Y/277V SWGR-1 WITH 2500A DRAW OUT TYPE MAIN CIRCUIT BREAKER WITH GFP AND THREE FEEDER CIRCUIT BREAKERS DRAW OUT TYPE WITH GFP.
- 10 PROVIDE 15kv, 3-1/C-350CMIL, 133% INSULATION, EPR CABLE AND 1/C #4 GND FROM SW454 TO VCB590 VIA VAULT #2 & MH E160.
- 11 PROVIDE 15kv, 1200A VACUUM CIRCUIT BREAKER SWITCHGEAR VCB590 INCLUDING CPT, VT AND ALL ACCESSORIES PER SPECIFICATION SECTION 26 13 00.00 20.
- 12 PROVIDE 15kv, 1200A VACUUM CIRCUIT BREAKER SWITCHGEAR VCB752 INCLUDING CPT, VT AND ALL ACCESSORIES PER SPECIFICATION SECTION 26 13 00.00 20.
- 13 PROVIDE OUTDOOR 208Y/120V SWGR-2 WITH 1200A DRAW OUT TYPE CIRCUIT BREAKER WITH GFP.

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DRAWN	N.NIZAMOVA	DATE	4.30.09		
DESIGNED	N.NIZAMOVA	DATE	4.30.09		
CHECKED	J.MCCUSKER	DATE	4.30.09		
PROJ.MGR	N.NIZAMOVA	DATE	4.30.09		
REQUESTER	N.HSU	DATE	4/19/09		
R&A		DATE			
SAFETY		DATE			
SUPERVISOR	S.FRANKEL	DATE	5.25.09		

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N221B OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

SITE PLANS
EXISTING/DEMOLITION & NEW WORK

SIZE: 25307
SCALE: 1"=500'

FILE NAME: A1---0810-057_1_R8.DWG 4-30-09

DWG: \\F19-m3\ccad\ARC\REDS\REDS Phase VIII\500_CAO\N221B_Outdoor Substation Upgrade - T172 and T173\Sheet\A1---0810-E057_1_R8.dwg Version: 17.1s (LMS Tech) Layer: pattern
 DATE: Apr 28, 2009 - 9:24:31 am

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DWG NO. A1---0810-E58

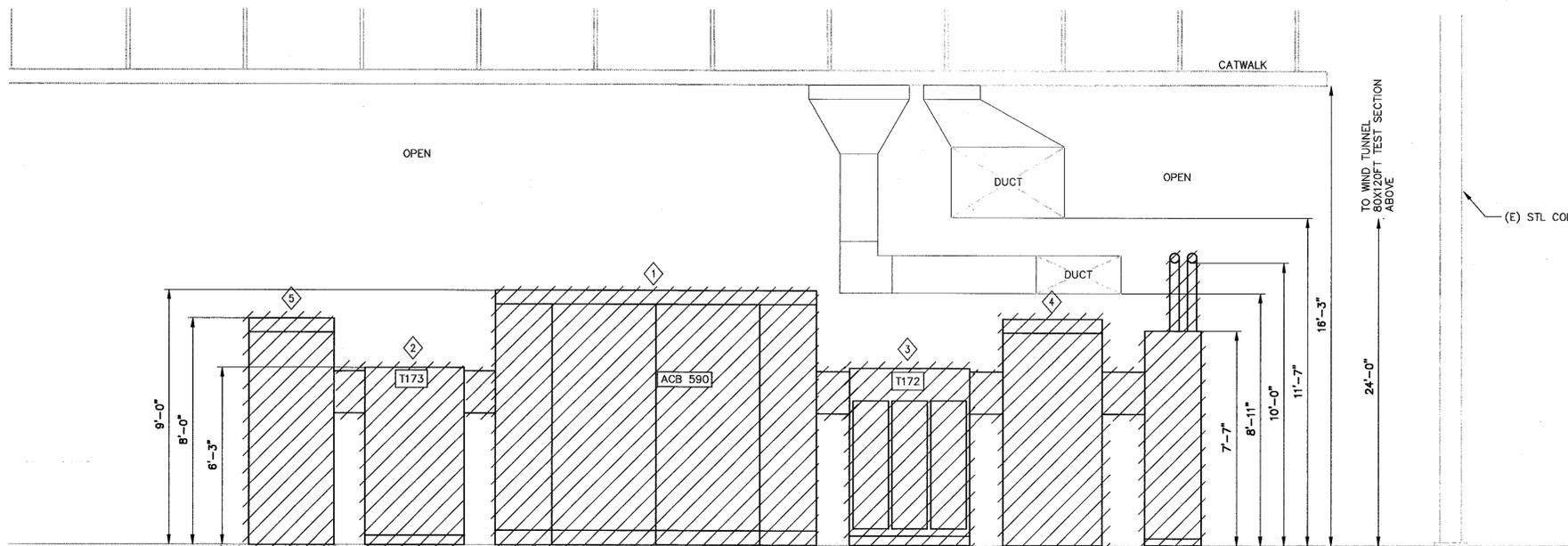
SHT REV

SHEET NOTES

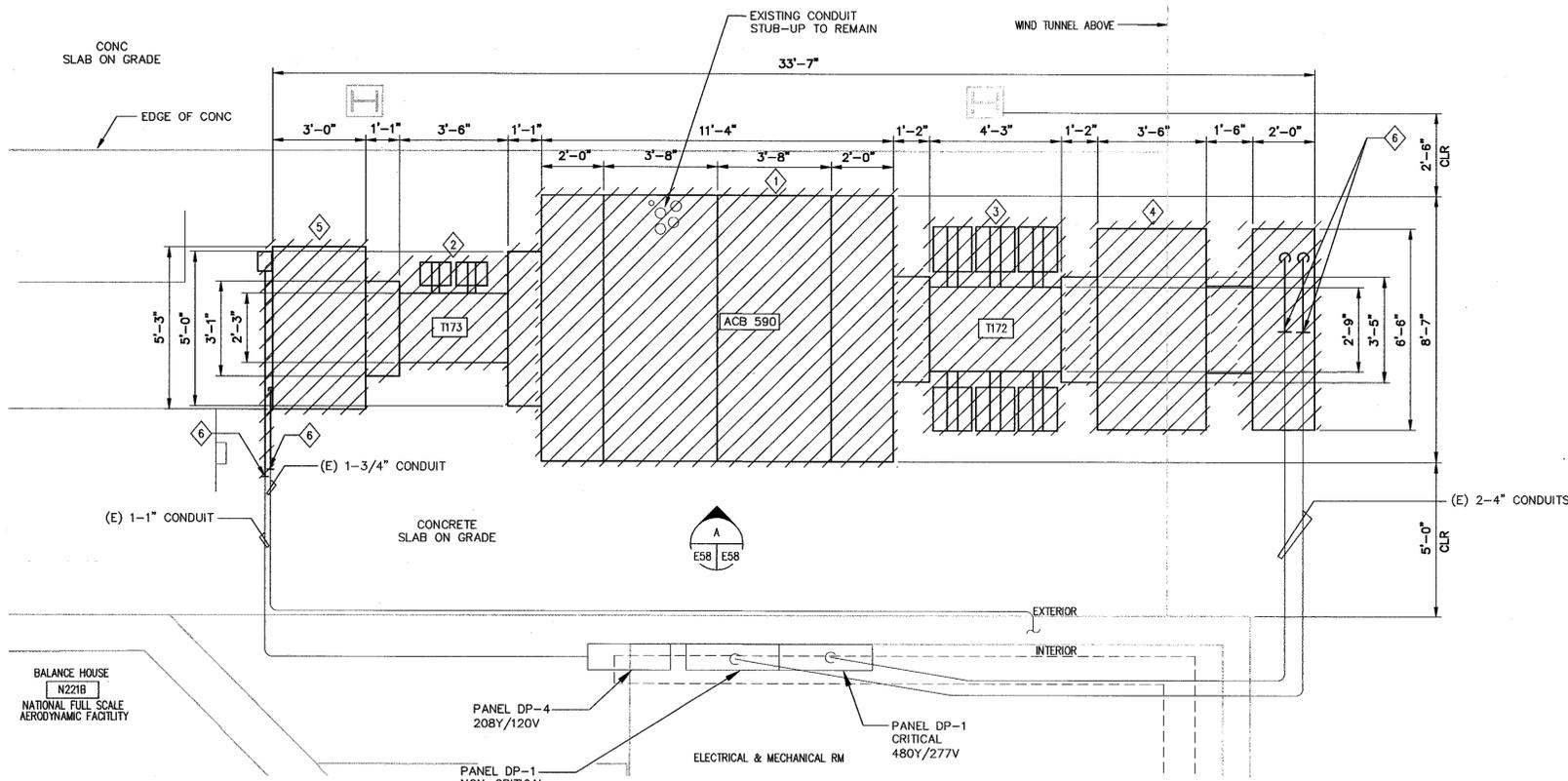
- FOR GENERAL CONSTRUCTION NOTES, SYMBOLS AND ABBREVIATIONS SEE DRAWING G4.
- HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED U.O.N.
- ALL EXISTING CONDUITS AND CONDUCTORS SHALL BE DISCONNECTED FROM (E) EQUIPMENT AND RECONNECTED TO NEW EQUIPMENT. CONTRACTOR SHALL DETERMINE IN FIELD AND PROVIDE PULL BOXES AND RELOCATE/EXTEND OR REPLACE (E) CONDUITS AND CONDUCTORS (MATCH EXISTING SIZE) TO COMPLETE CONNECTIONS TO NEW AND EXISTING EQUIPMENT.
- EXISTING GROUNDING SYSTEM TO REMAIN FOR RECONNECTION IN NEW WORK.
- PRIOR TO SHUTDOWN AND DEMOLITION WORK, CONTRACTOR SHALL PERFORM PHASE SEQUENCE TEST ON EXISTING SYSTEM/EQUIPMENT IN THE PRESENCE OF COTR.

KEY NOTES

- REMOVE EXISTING 15KV PRIMARY SWITCHGEAR AND CIRCUIT BREAKER ACB590 AND ALL ASSOCIATED EQUIPMENT AND DEVICES.
- REMOVE EXISTING TRANSFORMER T173 AND ALL ASSOCIATED EQUIPMENT AND DEVICES.
- REMOVE EXISTING TRANSFORMER T172 AND ALL ASSOCIATED EQUIPMENT AND DEVICES.
- REMOVE EXISTING 480Y/277V DISTRIBUTION SWITCHBOARD.
- REMOVE EXISTING 208Y/120V DISTRIBUTION SWITCHBOARD.
- CUT (E) CONDUIT AS SHOWN ON THE DRAWING. PULL (E) WIRES BACK TO THE PANEL LOCATED IN ELECTRICAL & MECHANICAL ROOM FOR LATER RECONNECTION.



A EQUIPMENT ELEVATION - DEMOLITION
SCALE: 3/8"=1'-0"



1 EQUIPMENT PLAN - DEMOLITION
SCALE: 3/8"=1'-0"

ADDITIVE 2

Approved for Construction
Moffett Field Permit Board
Nita Loh
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD

DATE	BY	DESCRIPTION
4.30.09	N.NIZAMOVA	DESIGNED
4.30.09	N.NIZAMOVA	CHECKED
4.30.09	J.MCCUSKER	PROGRM
4.30.09	N.NIZAMOVA	REQUESTER
4/30/09	N.HSU	R&QA

Ames Research Center
Moffett Field, California
RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII
N221B OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

EQUIPMENT PLAN AND ELEVATION DEMOLITION

DATE	BY	DESCRIPTION
5-5-09	S.FRANKEL	SUPERVISOR

SIZE D	CAGE CODE 25307	REV
SCALE: AS NOTED	INDEX	SHEET OF

FILE NAME: A1---0810-E058_1_RB.DWG 4-30-09

DWG: \\f19-m3\arc\ARC\REDS\Phase VII\300_CAD\N221B_Outdoor_Substation_Upgrade - T172 and T173\Sheet\A1---0810-E058_1_RB.DWG User: polden DATE: Apr 29, 2009 - 9:24:41 am

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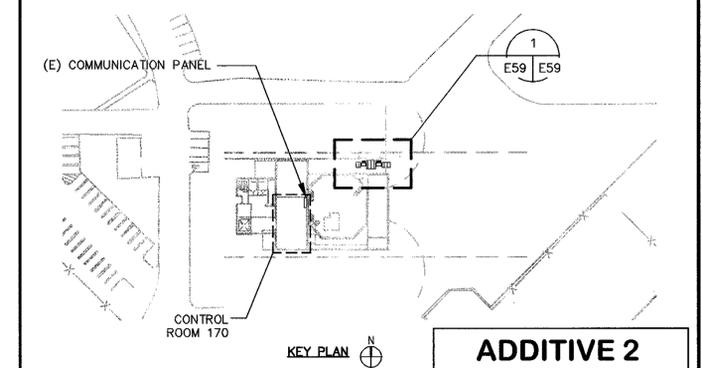
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 DATE: Apr 29, 2009 - 9:24:52 am

SHEET NOTES

1. FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4.
2. LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
3. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
4. CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.
5. ALL EXISTING CONDUITS AND CONDUCTORS SHALL BE RECONNECTED TO NEW EQUIPMENT. CONTRACTOR SHALL DETERMINE IN FIELD AND PROVIDE PULL BOXES AND RELOCATE/EXTEND OR REPLACE (E) CONDUITS AND CONDUCTORS (MATCH EXISTING SIZE) TO COMPLETE CONNECTIONS TO NEW AND EXISTING EQUIPMENT.
6. ALL ELECTRICAL CONDUITS SHALL BE SECURELY FASTENED IN PLACE IN ACCORDANCE WITH CEC, SECTION 358.30.
7. SEE DRAWING S6 FOR CONCRETE PAD DETAIL.

KEY NOTES

- 1 PROVIDE NEW OUTDOOR LIQUID-FILLED 1500kVA TRANSFORMER T172 WITH DUAL RATED PRIMARY WINDING, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- 2 PROVIDE NEW OUTDOOR LIQUID-FILLED 300kVA TRANSFORMER T173 WITH DUAL RATED PRIMARY WINDING, INCLUDING ALL ACCESSORIES PER SPECIFICATION SECTION 26 12 00.00 40.
- 3 PROVIDE OUTDOOR 480Y/277V SWBD-1 WITH 2500A MAIN CIRCUIT BREAKER DRAW OUT TYPE AND THREE FEEDER CIRCUIT BREAKERS DRAW OUT TYPE WITH GFP.
- 4 PROVIDE 15kV, 1200A VACUUM CIRCUIT BREAKER SWITCHGEAR VCB590 INCLUDING CPT, VT AND ALL ACCESSORIES PER SPECIFICATION SECTION 26 13 00.00 20.
- 5 PROVIDE 15kV, 1200A VACUUM CIRCUIT BREAKER SWITCHGEAR VCB752 INCLUDING CPT, VT AND ALL ACCESSORIES PER SPECIFICATION SECTION 26 13 00.00 20.
- 6 PROVIDE OUTDOOR 208Y/120V SWBD-2 WITH 1200A DRAW OUT TYPE CIRCUIT BREAKER WITH GFP.
- 7 EXISTING CONDUIT STUB-UP TO BE REUSED IN NEW WORK.
- 8 CONNECT NEW EQUIPMENT TO EXISTING GROUNDING SYSTEM WITH #4/0 BARE COOPER GROUND CONDUCTOR.
- 9 PROVIDE 3/4" CONDUIT WITH (2) CAT 5E ETHERNET CABLES, ONE FROM EACH APMS IN MV SWITCHGEAR (APMS #115 & APMS #130) TO COMMUNICATION PANEL IN CONTROL ROOM # 170. INSTALL CONDUIT NOT MORE THAN 5 FEET FROM THE PANEL. PROVIDE ADDITIONAL 25 FEET OF CABLE AND RJ-45 CONNECTORS AT EACH END. ETHERNET CABLE HOOK UP TO COMMUNICATION PANEL AND APMS WILL BE PERFORMED BY OTHERS. APPROXIMATE DISTANCE FROM MV SWGR TO COMMUNICATION PANEL IS 120 FEET. SEE KEY PLAN ON THIS DRAWING FOR COMMUNICATION PANEL LOCATION.
- 10 RECONNECT EXISTING CONDUITS AND CONDUCTORS TO NEW EQUIPMENT. CONTRACTOR SHALL DETERMINE IN FIELD AND PROVIDE PULL BOXES AND RELOCATE, EXTEND OR REPLACE (E) CONDUITS AND CONDUCTORS (MATCH EXISTING SIZE) TO COMPLETE CONNECTIONS TO NEW AND EXISTING EQUIPMENT.



Approved for Construction
 Moffett Field Permit Board
N. S. S. S.
 Chief Building Official
 Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	N.NIZAMOVA	DATE	4/30/09
DESIGNED	N.NIZAMOVA	DATE	4/30/09
CHECKED	J.McCUSKER	DATE	4/30/09
PROJ.MGR	N.NIZAMOVA	DATE	4/30/09
REQUESTER	N.HSU	DATE	4/30/09
R&A		DATE	

Ames Research Center
 Moffett Field, California

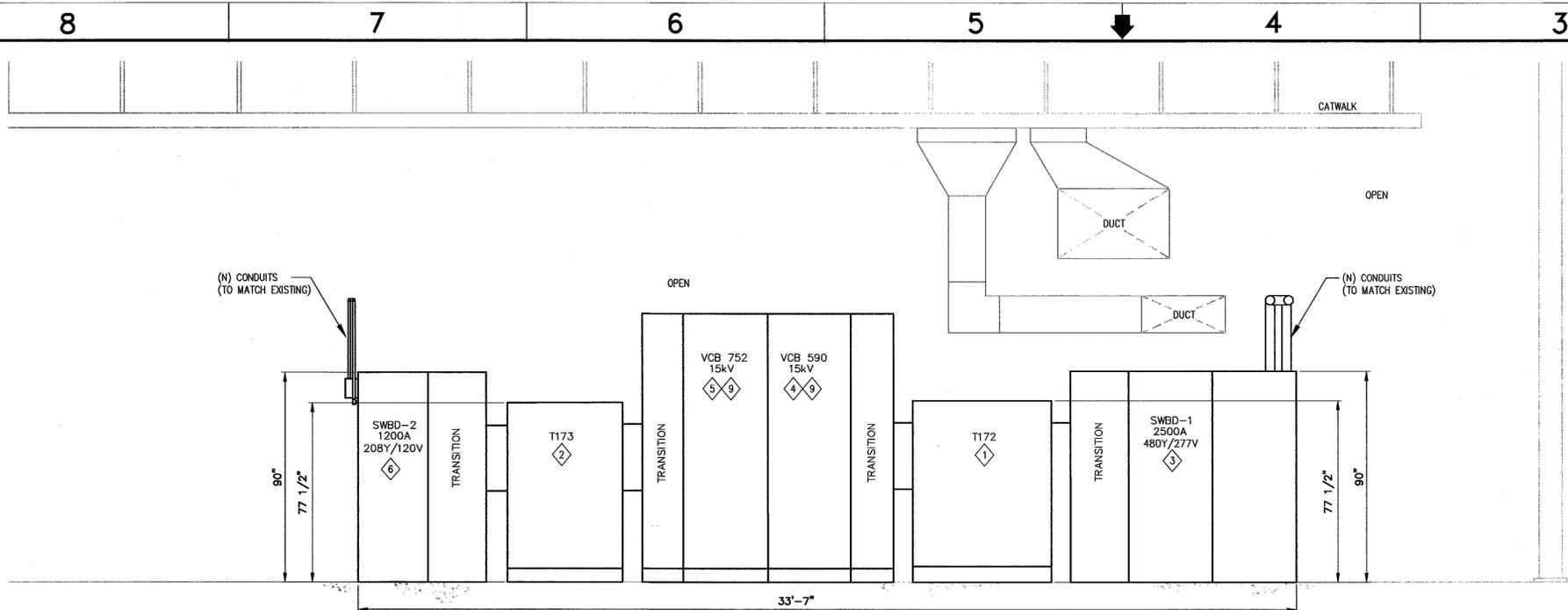
RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
 N221B OUTDOOR SUBSTATION UPGRADE
 ELECTRICAL

**EQUIPMENT PLAN AND ELEVATION
 NEW WORK**

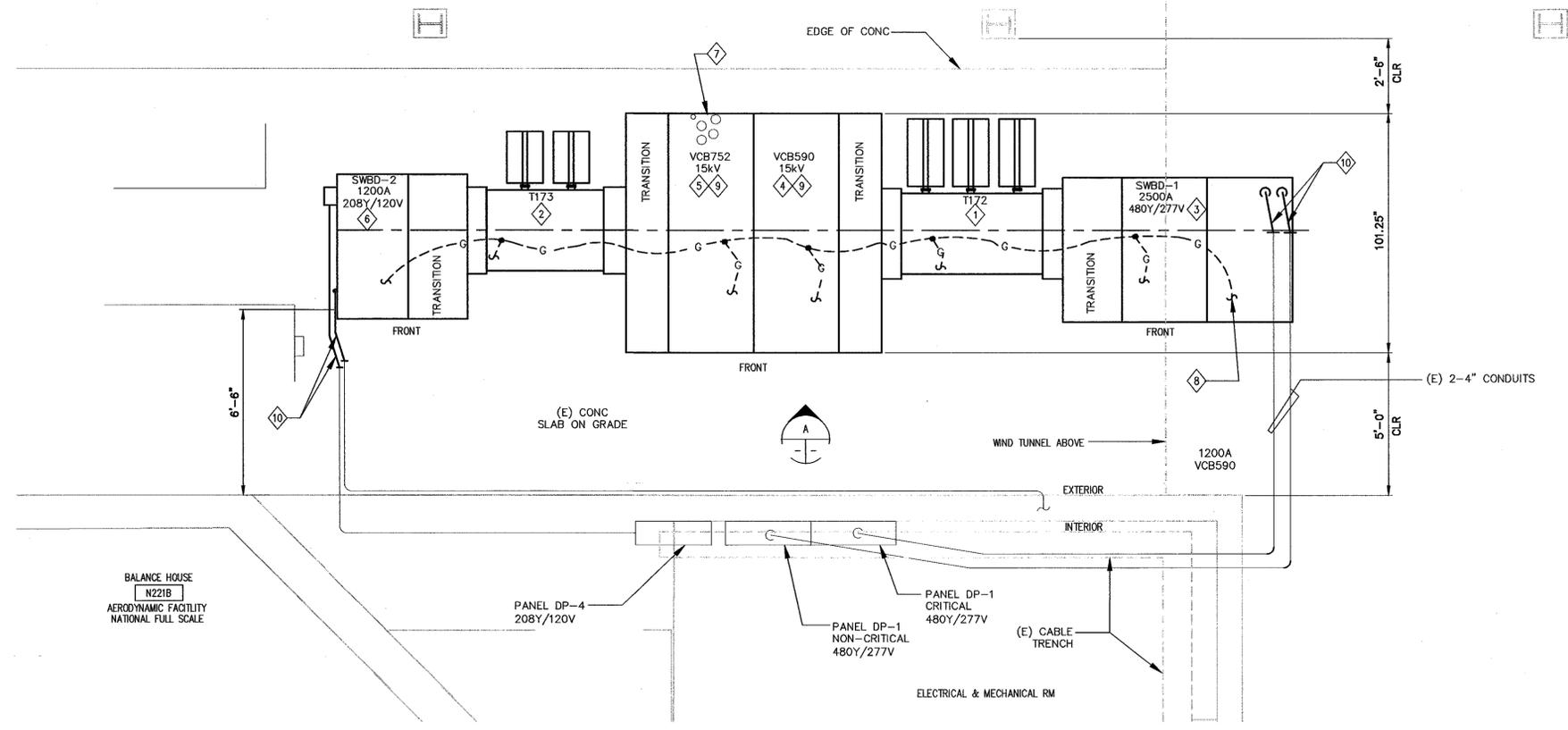
SAFETY		DATE	
SUPERVISOR	S.FRANKEL	DATE	5-1-09

SIZE	D	CAGE CODE	25307
SCALE	AS NOTED	INDEX	

FILE NAME:
 A1---0810-E059_1_RB.DWG 4-30-09



1 EQUIPMENT ELEVATION - NEW WORK
 SCALE: 3/8"=1'-0"



1 EQUIPMENT PLAN - NEW WORK
 SCALE: 3/8"=1'-0"

BALANCE HOUSE
 N221B
 AERODYNAMIC FACILITY
 NATIONAL FULL SCALE

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DWG NO. A1---0810-E60

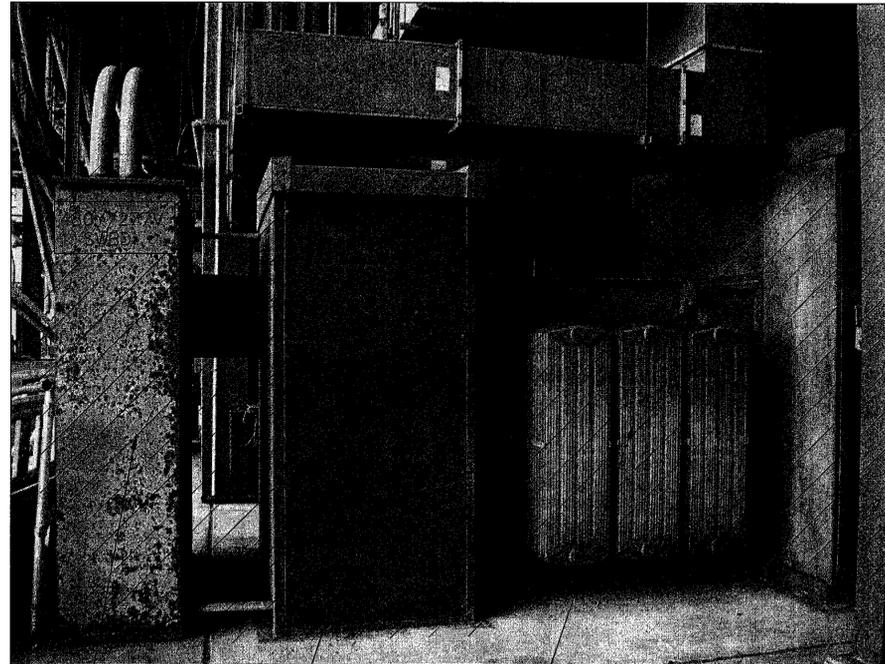
SHT 1 REV

SHEET NOTES

- 1. FOR GENERAL CONSTRUCTION NOTES, SYMBOLS & ABBREVIATIONS SEE DRAWING G4.
- 2. HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED/REMOVED, U.O.N.
- 3. PRIOR TO SHUTDOWN AND DEMOLITION WORK, CONTRACTOR SHALL PERFORM PHASE SEQUENCE TEST ON EXISTING SYSTEM/EQUIPMENT IN THE PRESENCE OF COTR.
- 4. ALL DISCONNECTED CABLES/EQUIPMENT SHALL BE PROPERLY IDENTIFIED, TAGGED/LABELED FOR RESTORATION IN NEW WORK.

KEY NOTES

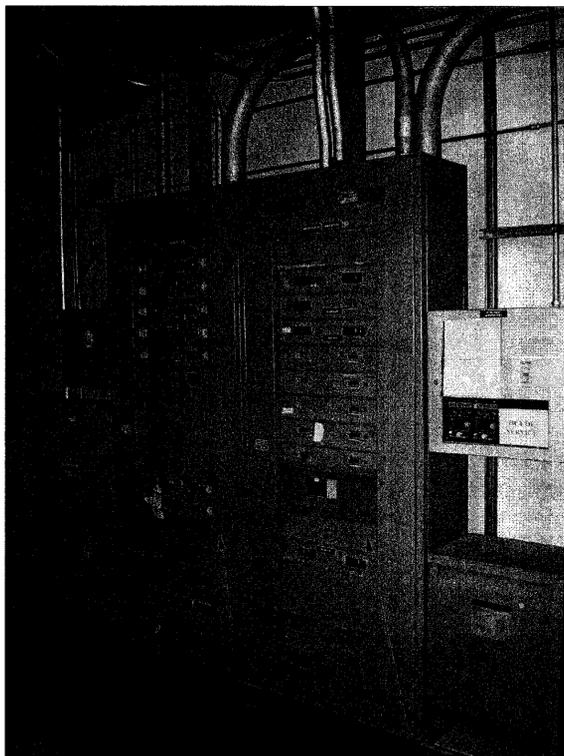
- 1 REMOVE (E) 480Y/277V SWITCHBOARD AS SHOWN.
- 2 REMOVE (E) CONDUITS AS SHOWN.
- 3 REMOVE (E) 208Y/120V SWITCHBOARD AS SHOWN.
- 4 REMOVE (E) OUTDOOR TRANSFORMER T173 AS SHOWN.
- 5 REMOVE (E) OUTDOOR TRANSFORMER T172 AS SHOWN.
- 6 REMOVE (E) MV SWITHCGEAR AS SHOWN.
- 7 (E) PANEL DP-4, 208Y/120V.
- 8 (E) PANEL DP-1 NON CRITICAL, 480Y/277V.
- 9 (E) PANEL DP-1 CRITICAL, 480Y/277V.



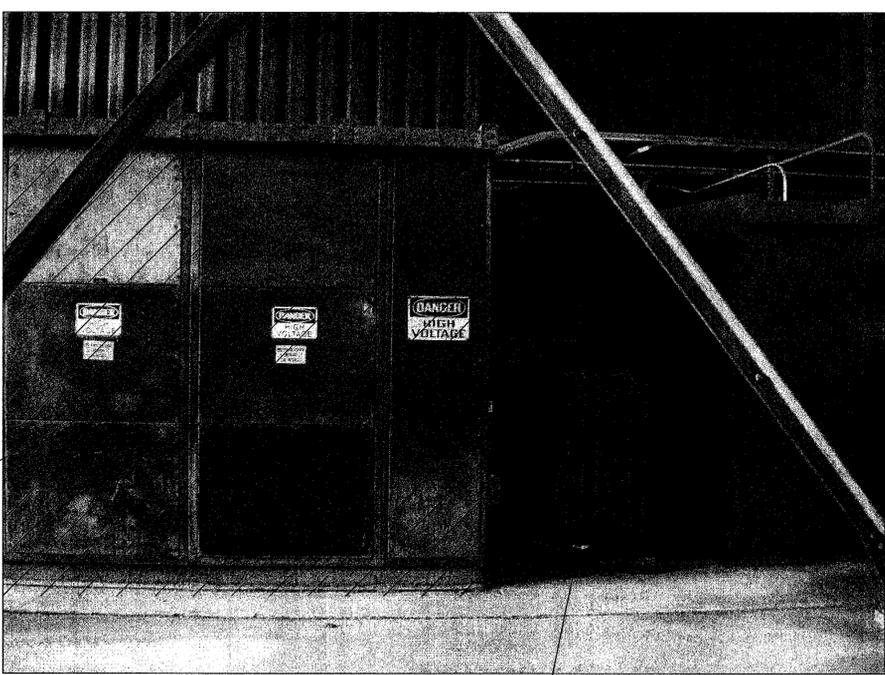
1 (E) N221B SUBSTATION DETAIL
E60 E59 SCALE:



1 (E) N221B SUBSTATION DETAIL
E60 E59 SCALE:



1 (E) PANELS DP-1 & DP-4 DETAILS
E60 E59 SCALE:



1 (E) N221B SUBSTATION DETAIL
E60 E59 SCALE:

ADDITIVE 2

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN N.NIZAMOVA	DATE 4/30/09
DESIGNED N.NIZAMOVA	DATE 4/30/09
CHECKED J.MCCUSKER	DATE 4/30/09
PROJMR N.NIZAMOVA	DATE 4/30/09
REQUESTER N.HSU	DATE 4/30/09
R&QA	DATE

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM--PHASE VIII
N221B OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

PHOTO DETAILS
EXISTING/DEMOLITION

SUPERVISOR S.FRANKEL	DATE 5-5-09
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SIZE D	CAGE CODE 25307
SCALE AS NOTED	INDEX

FILE NAME: A1---0810-E060_1_R8.DWG	4-30-09
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 DATE: Apr 29, 2009 - 9:26:02 am

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DWG NO. A1---0810-E61

SHT REV

SHEET NOTES

- 1. HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED. U.O.N.
- 2. THE DIAGRAM IS PROVIDED FOR GUIDANCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT INCLUDING TERMINAL BLOCKS, TERMINAL IDENTIFICATION NUMBER, CONNECTIONS ETC. AND REVISE DRAWINGS AS NEEDED TO MATCH EXISTING AND NEW EQUIPMENT TO PROVIDE A COMPLETE FUNCTIONAL SYSTEM.
- 3. THE CONTROL DIAGRAM IS BASED ON THE LATEST KNOWN EXISTING DRAWINGS.

KEY NOTES

- ① DISCONNECT AND REMOVE EXISTING ACB SWITCHGEAR AND ALL ASSOCIATED DEVICES AND ACCESSORIES.

ADDITIVE 2

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN N.NIZAMOVA	DATE 4.30.09
DESIGNED N.NIZAMOVA	DATE 4.30.09
CHECKED J.MCCLUSKER	DATE 4.30.09
PROJWGR N.NIZAMOVA	DATE 4.30.09
REQUESTER N.HSU	DATE 4.30.09
R&QA	DATE

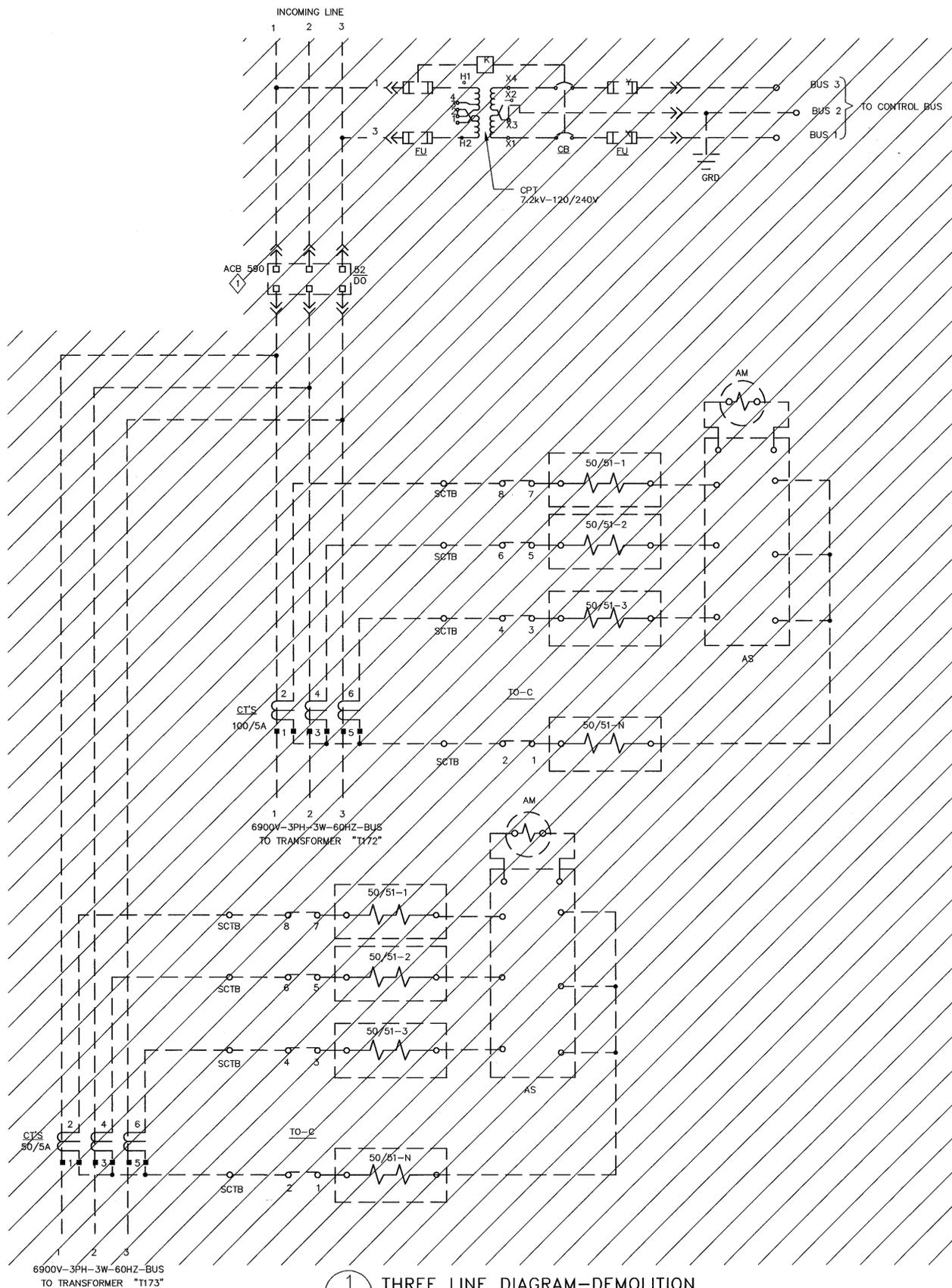
Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM—PHASE VIII
N221B OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

THREE LINE DIAGRAM
DEMOLITION

SUPERVISOR S.FRANKEL	DATE 5-5-09	SIZE D	CAGE CODE 25307	INDEX	SHEET OF
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FILE NAME:
A1---0810-E61_L1_R8.DWG 4-30-09



① THREE LINE DIAGRAM—DEMOLITION
SCALE: N.T.S.

DWG: \\f19-m3\cadd\ARC\ARC\REDS\REDS Phase VIII\500_CAD\N221B_Outdoor Substation Upgrade - T172 and T173\Sheet\A1---0810-E61_L1_R8.dwg Version: 17.1s (LMS Tech) User: pdillen
 DATE: Apr 29, 2009 - 9:25:15 am

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SHEET NOTES

1. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
2. THE DIAGRAM IS PROVIDED FOR GUIDANCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT INCLUDING TERMINAL BLOCKS, TERMINAL IDENTIFICATION NUMBER, CONNECTIONS ETC. AND REVISE DRAWINGS AS NEEDED TO MATCH EXISTING AND NEW EQUIPMENT TO PROVIDE A COMPLETE FUNCTIONAL SYSTEM.
3. ALL CT WIRES SHALL BE #10 AWG MINIMUM, TYPE SIS. ALL VOLTAGE, CPT SECONDARY AND BREAKER TRIP WIRES SHALL BE #12 AWG MINIMUM, TYPE SIS. U.O.N.

KEY NOTES

- 1 PROVIDE NEW 15KV, 1200A SWITCHGEAR WITH 15KV VACUUM CIRCUIT BREAKER VCB 590 AND ACCESSORIES PER SPECIFICATION.
- 2 PROVIDE NEW 15KV, 1200A SWITCHGEAR WITH 15KV VACUUM CIRCUIT BREAKER VCB 752 AND ACCESSORIES PER SPECIFICATION.
- 3 PROVIDE GFE ALSTOM RELAY COMPLETELY WIRED INTO THE NEW EQUIPMENT.
- 4 PROVIDE GFE DIGITAL POWER METER COMPLETELY WIRED INTO THE NEW EQUIPMENT. SEE KEY NOTE 4 ON DRAWING E59 FOR CONNECTION DETAILS.
- 5 PROVIDE FUSE BLOCK, FLEXCORE KLK-3 OR APPROVED EQUAL.
- 6 PROVIDE (8) CIRCUIT SHORTING TERMINAL BLOCKS (SCTB), FLEXCORE 1KU6SC OR APPROVED EQUAL.
- 7 PROVIDE (2) SETS OF 3 WINDOW-TYPE MULTI-RATIO CT'S ON THE LINE SIDE OF EACH BREAKER.
- 8 PROVIDE (2) ADDITIONAL SPARE SETS OF CT'S ON THE LOAD SIDE OF EACH BREAKER. ALL CT'S SHALL BE C200 ACCURACY.

ADDITIVE 2

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

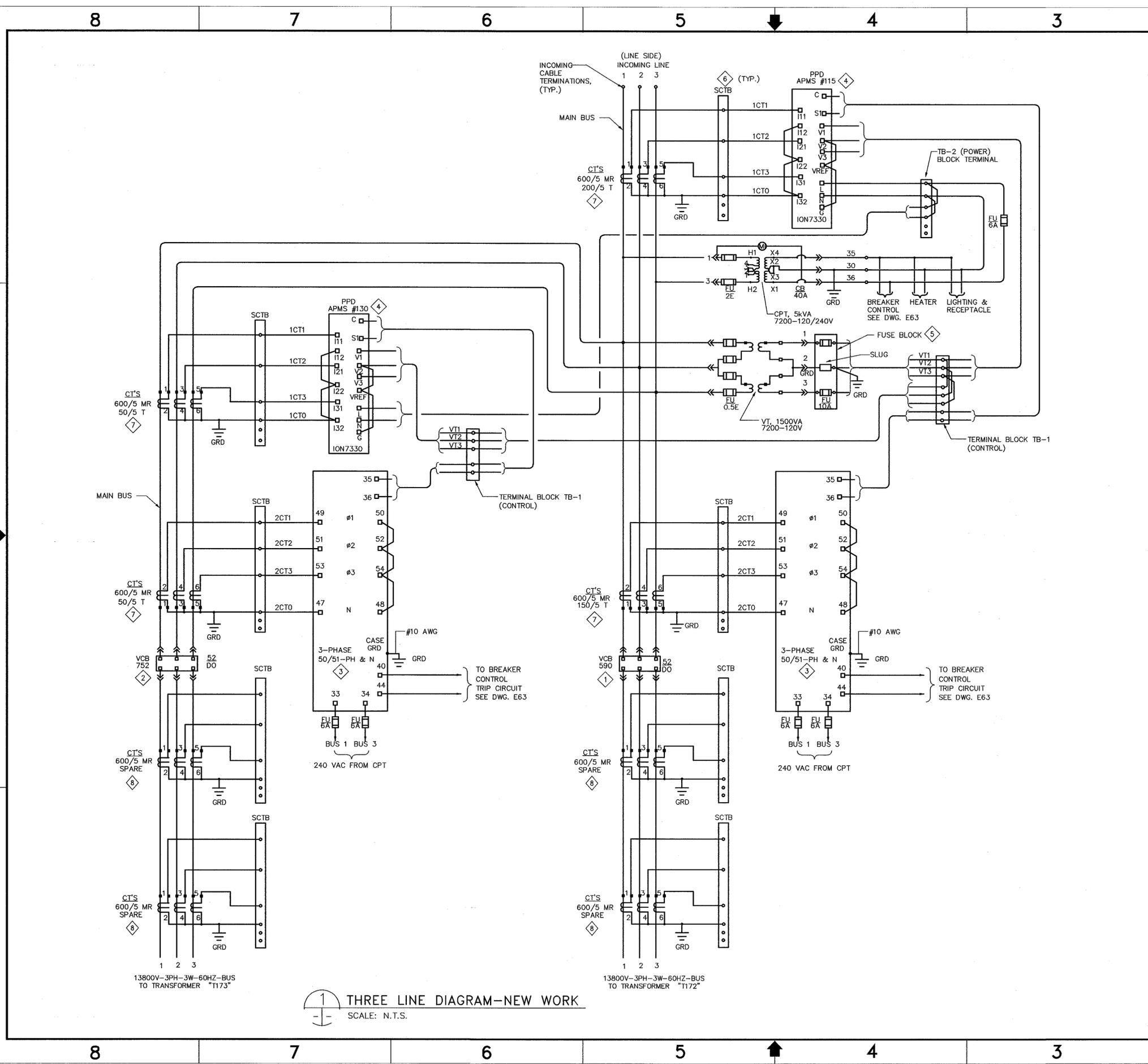
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DESIGNED	N.NIZAMOVA	DATE	4.30.09
CHECKED	J.MCCUSKER	DATE	4.30.09
PROGRMR	N.NIZAMOVA	DATE	4.30.09
REQUESTER	N.HSU	DATE	4.30.09
R&QA		DATE	

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM—PHASE VIII
N221B OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

THREE LINE DIAGRAM
NEW WORK

SUPERVISOR	S.FRANKEL	DATE	4-7-09	SIZE	D	CAGE CODE	25307	REV	
SCALE:		INDEX		SHEET	OF				



THREE LINE DIAGRAM—NEW WORK
SCALE: N.T.S.

DWG: \\fer19-m3\cadd\ARC\REDS\REDS Phase VIII\500_CAD\N221B_Outdoor Substation Upgrade - 1172 and 1173\Sheet\A1---0810-E62_1.R8.dwg Version: 17.1s (LMS Tech) User: polden
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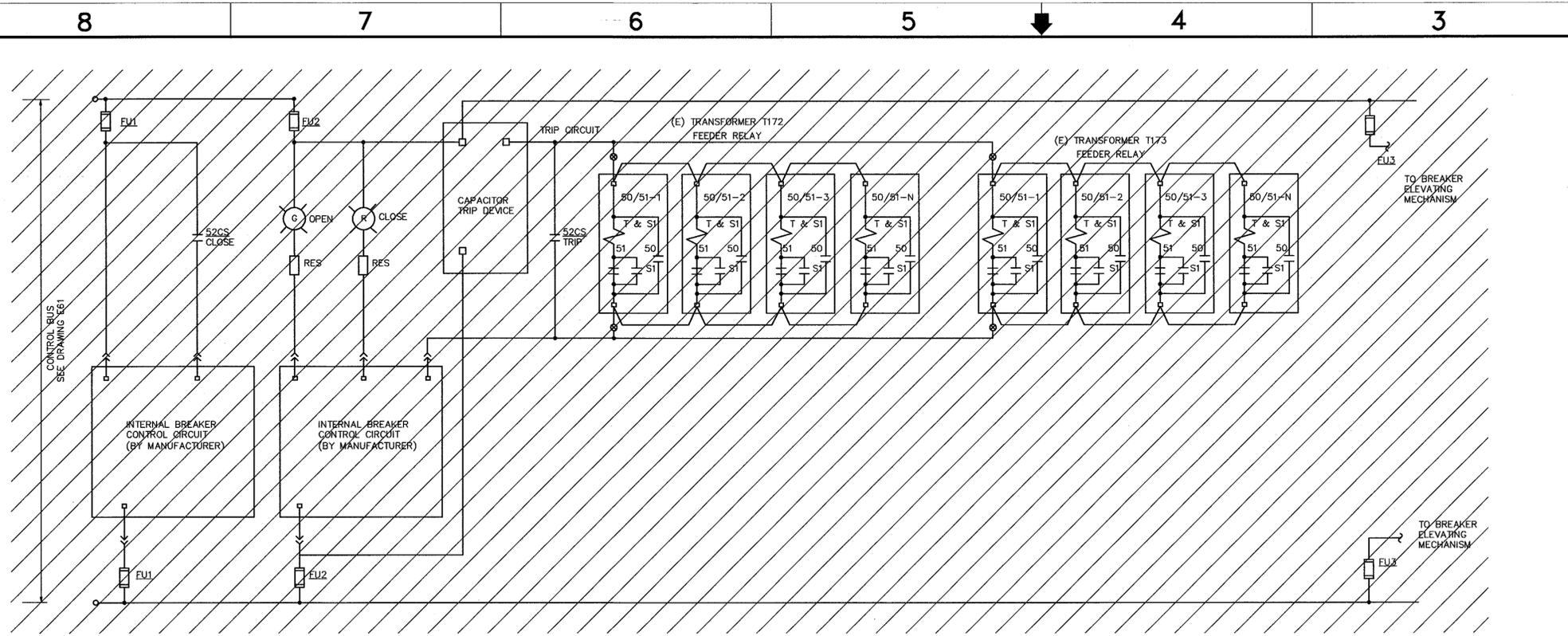
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SHEET NOTES

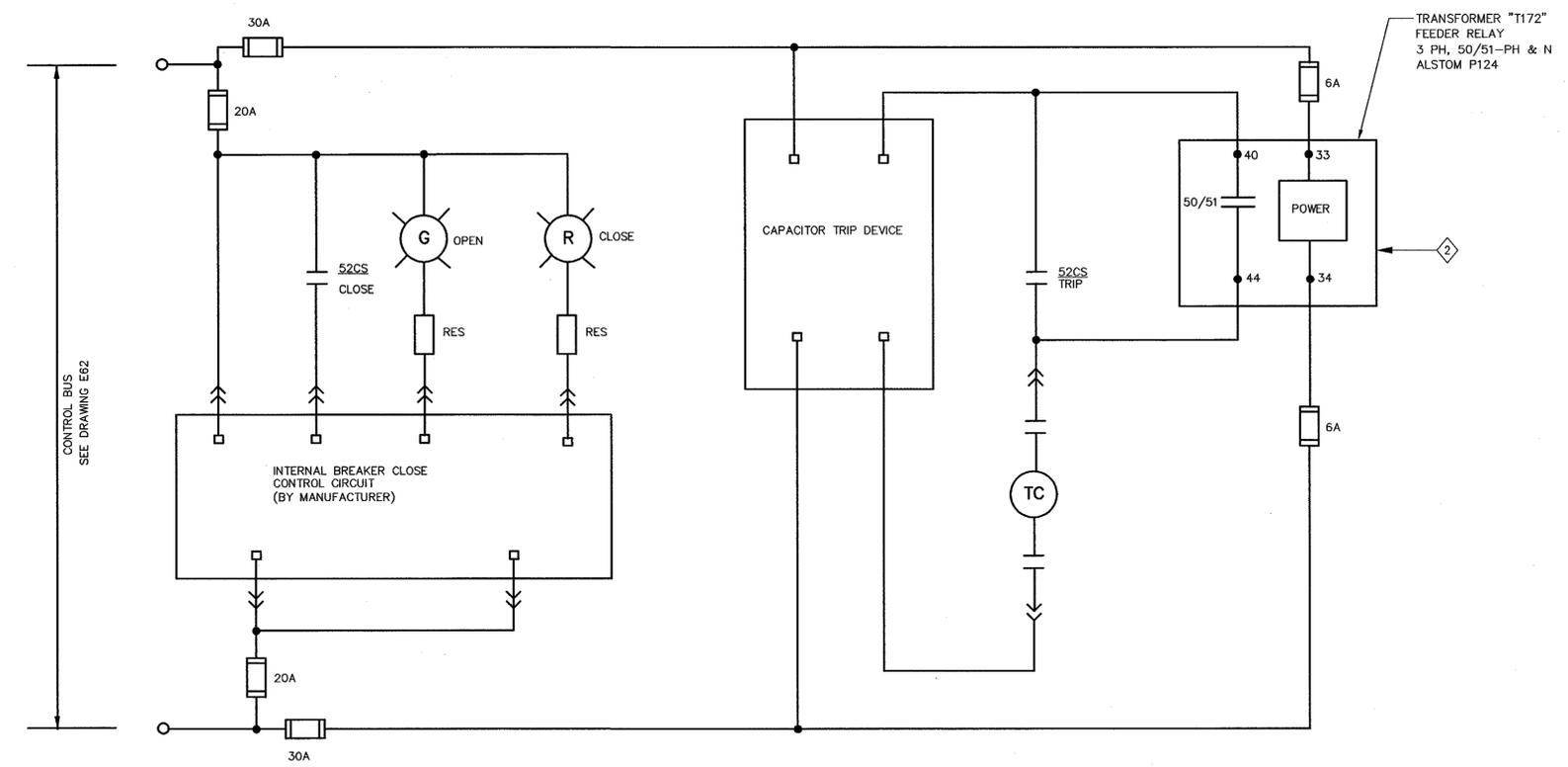
1. HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED. U.O.N.
2. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
3. THE DIAGRAMS ARE PROVIDED FOR GUIDANCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT INCLUDING TERMINAL BLOCKS, TERMINAL IDENTIFICATION NUMBER, CONNECTIONS ETC. AND REVISE DRAWINGS AS NEEDED TO MATCH EXISTING AND NEW EQUIPMENT TO PROVIDE A COMPLETE FUNCTIONAL SYSTEM.
4. THE CONTROL DIAGRAMS ARE BASED ON THE LATEST KNOWN EXISTING DRAWINGS.
5. NEW TERMINAL MARKINGS ARE BASED ON CUTLER HAMMER INFORMATION.

KEY NOTES

- 1 DISCONNECT AND REMOVE EXISTING ACB447 SWITCHGEAR INCLUDING ALL ASSOCIATED DEVICES AND ACCESSORIES.
- 2 INSTALL NEW GFE 3 PHASE MICROPROCESSOR BASED RELAY, ALSTOM MICOM P124 COMPLETELY WIRED INTO THE EQUIPMENT.
- 3 TYPICAL BREAKER CONTROL DIAGRAM WITH THE RELATED TRANSFORMER FEEDER RELAYS. FOR SUBSTATION ONE LINE DIAGRAMS AND THREE LINE DIAGRAMS, REFER TO THE DRAWINGS E56 AND E62 RESPECTIVELY.



VCB590 BREAKER CONTROL DIAGRAM - DEMOLITION
SCALE: NTS



VCB 590 BREAKER CONTROL DIAGRAM - NEW WORK (SIMILAR FOR VCB 752 & T173)
SCALE: NTS

ADDITIVE 2

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN N.NIZAMOVA	DATE 4.30.09
DESIGNED N.NIZAMOVA	DATE 4.30.09
CHECKED J.MCCLUSKER	DATE 4.30.09
PROJMR N.NIZAMOVA	DATE 4.30.09
REQUESTER N.HSU	DATE 4.30.09
R&QA	DATE

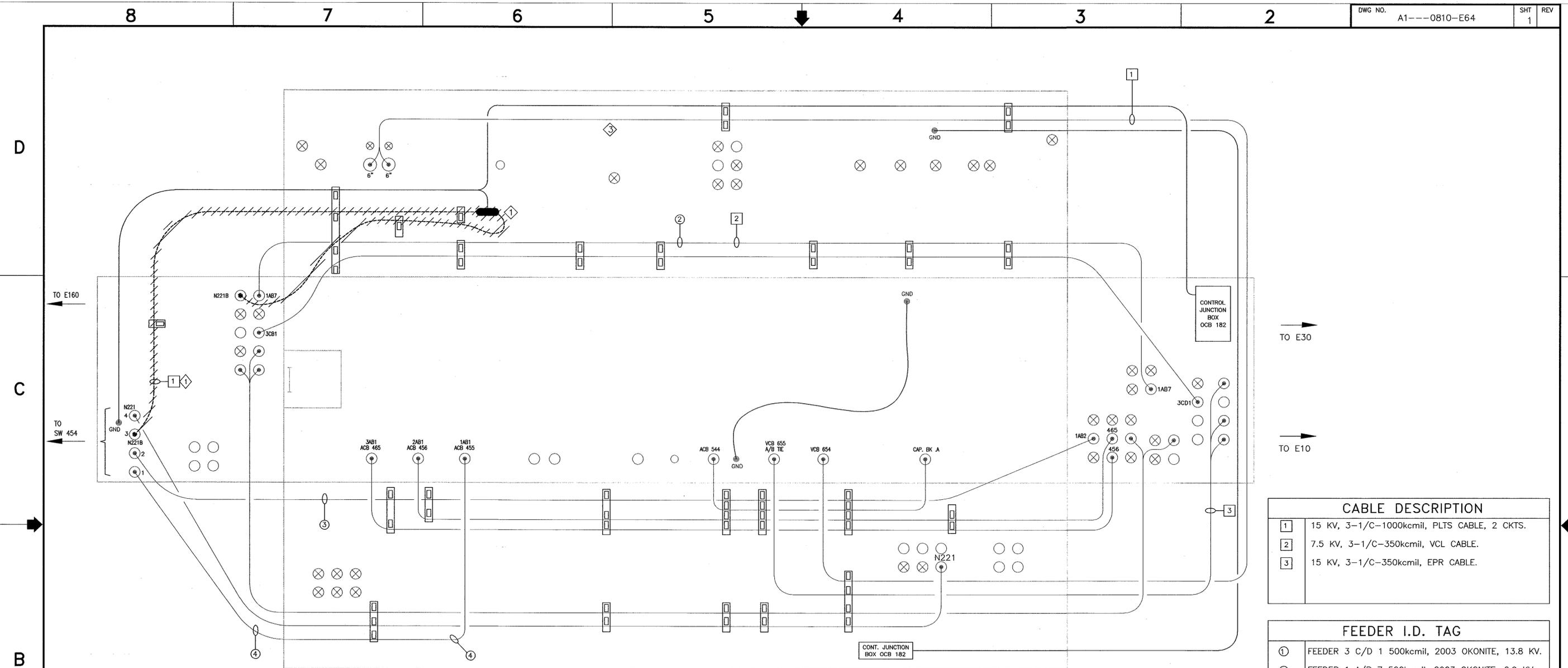
Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM—PHASE VII
N221B OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

VCB590 BREAKER CONTROL DIAGRAM—DEMOLITION & NEW WORK		SIZE D	CAGE CODE 25307	SCALE 1"=1'-0"	INDEX	SHEET OF
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DWG: \\F19-m3\cadd\ARC\REDS\REDS Phase VIII\500_CAD\N221B_Outdoor Substation Upgrade - T172 and T173\Sheet\A1---0810-E063_1_RB.dwg Version: 17.1s (LMS Tech) User: patiem
 Date: Apr 29, 2009 - 9:25:22 am

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TO E160
TO SW 454
TO E30
TO E10

CABLE DESCRIPTION	
1	15 KV, 3-1/C-1000kcmil, PLTS CABLE, 2 CKTS.
2	7.5 KV, 3-1/C-350kcmil, VCL CABLE.
3	15 KV, 3-1/C-350kcmil, EPR CABLE.

FEEDER I.D. TAG	
1	FEEDER 3 C/D 1 500kcmil, 2003 OKONITE, 13.8 KV.
2	FEEDER 1 A/B 7 500kcmil, 2003 OKONITE, 6.9 KV.
3	FEEDER 1 A/B 2 500kcmil, 2003 OKONITE, 6.9 KV.
4	FEEDER 1 A/B 1 500kcmil, 2003 OKONITE, 6.9 KV.

1 VAULT NO. 2 DETAIL - EXISTING/DEMOLITION
SCALE: NTS (N225 S. Substation)



ADDITIVE 2

SHEET NOTES	
1.	SHEET NOTES #1,2,3 ARE NOT PART OF THIS CONTRACT (THE INTENTION IS FOR NASA 'IN-HOUSE' USE).
2.	THIS DRAWING IS NOT THE CONTROLLED NASA AMES CONFIGURATION MANAGEMENT BASELINE DRAWING.
3.	THE AMES CONFIGURATION MANAGEMENT BASELINE DRAWING THAT WAS USED TO CREATE THE PROJECT DRAWING IS A1---9801-E402, SH.1.
4.	NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON DRAWING.
5.	HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED, U.O.N.
6.	CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS AT THE SITE AND SHALL BE RESPONSIBLE FOR THEIR ACCURACY PRIOR TO STARTING ANY WORK OR ORDERING ANY MATERIAL.
7.	FOR N221B OUTDOOR SUBSTATION SITE PLAN - EXISTING/DEMO & NEW WORK SEE DRAWING E57.

KEY NOTES	
1	DISCONNECT AND REMOVE EXISTING CABLE FROM SWITCH SW 454 TO N221B SUBSTATION ACB 590 SWITCHGEAR VIA VAULT # 2 & MH E160.
2	ALL INFORMATION INCLUDED IN THIS DETAIL IS CONSIDERED AS EXISTING CONDITIONS BASED ON LATEST KNOWN EXISTING DRAWINGS.

NASA REFERENCE DRAWINGS	
A1---9801-E402 SH 1 UNDERGROUND POWER DISTRIBUTION VAULT #2.	

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DRAWN	N.NIZAMOVA	4/30/09			
DESIGNED	N.NIZAMOVA	4/30/09			
CHECKED	J.MCCUSKER	4/30/09			
FORUMGR	N.NIZAMOVA	4/30/09			
REQUESTER	N.HSU	4/30/09			
R&QA					
SAFETY					
SUPERVISOR	S.FRANKEL	5-12-09			

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII
N221B OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

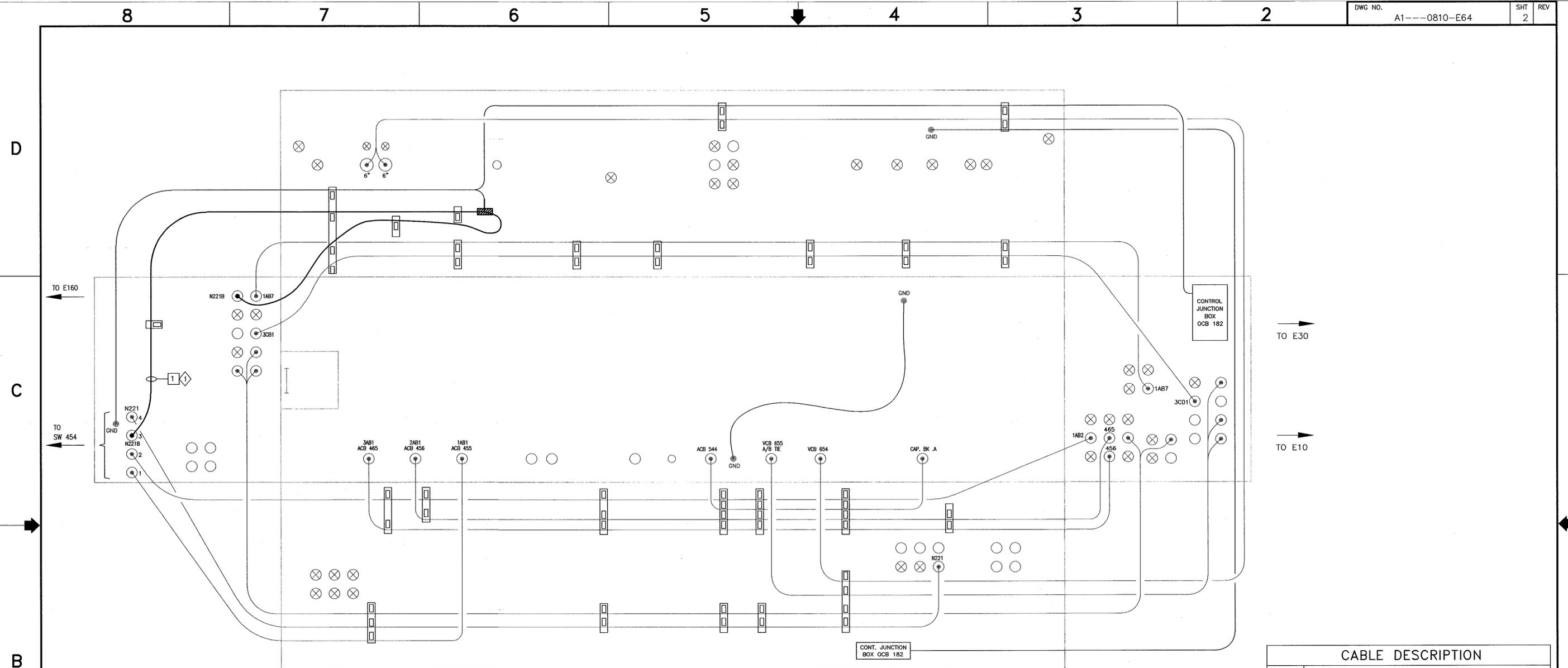
**VAULT # 2 DETAILS
EXISTING/DEMOLITION & NEW WORK**

SIZE	D	CAGE CODE	25307
SCALE	NONE	INDEX	

FILE NAME: A1---0810-E64_1_R6.DWG 4-30-09

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 DATE: Apr 29, 2009 - 9:25:44 am

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1 VAULT NO. 2 DETAIL - NEW WORK (N225 S. Substation) SCALE: NTS

CABLE DESCRIPTION	
1	15 KV, 3-1/C-350kcmil, EPR CABLE & 1/C # 4 GND

ADDITIVE 2

- SHEET NOTES**
- SHEET NOTES #1,2,3 ARE NOT PART OF THIS CONTRACT (THE INTENTION IS FOR NASA 'IN-HOUSE' USE).
 - THIS DRAWING IS NOT THE CONTROLLED NASA AMES CONFIGURATION MANAGEMENT BASELINE DRAWING.
 - THE AMES CONFIGURATION MANAGEMENT BASELINE DRAWING THAT WAS USED TO CREATE THE PROJECT DRAWING IS A1---9801-E402, SH. 1.
 - NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON DRAWING.
 - CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS AT THE SITE AND SHALL BE RESPONSIBLE FOR THEIR ACCURACY PRIOR TO STARTING ANY WORK OR ORDERING ANY MATERIAL.
 - UPON COMPLETION OF CABLE WORK AND PRIOR ENERGIZATION, CONTRACTOR SHALL INFORM GOVERNMENT FOR TAKING AS-BUILT PHOTOS AND UPDATING OF NASA REFERENCE DWG.
 - FOR N221B OUTDOOR SUBSTATION SITE PLAN - EXISTING/DEMO & NEW WORK SEE DRAWING E57.
 - LIGHT LINES INDICATE EXISTING CONDITION AND DARK LINES INDICATE NEW WORK.
 - NEW CABLE ROUTING INSIDE THE VAULT IS SHOWN DIAGMATICALLY. EXACT CABLE ROUTING INSIDE VAULT SHALL BE IN ACCORDANCE WITH DWG E86.

- KEY NOTES**
- PROVIDE 15kv, 3-1/C-350KCMIL, 133 % INS., EPR CABLE AND 1/C #4 GND FROM SWITCH SW 454 TO VCB 590. INSTALL FEEDER IDENTIFICATION TAG & PHASE IDENTIFICATION COLOR TAPE.
 - ALL INFORMATION INCLUDED IN THIS DETAIL IS CONSIDERED AS EXISTING CONDITIONS BASED ON LATEST KNOWN EXISTING DRAWINGS.

NASA REFERENCE DRAWINGS

A1---9801-E402 SH 1 UNDERGROUND POWER DISTRIBUTION VAULT #2.

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DRAWN	N.NIZAMOVA	DATE	4/30/09		
DESIGNED	N.NIZAMOVA	DATE	4/30/09		
CHECKED	J.MCCUSKER	DATE	4/30/09		
PROJECT	N.NIZAMOVA	DATE	4/30/09		
REQUESTER	N.HSLU	DATE	4/30/09		
R&QA		DATE			
SAFETY		DATE			
SUPERVISOR	S.FRANKEL	DATE	5-5-09		

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
N221B OUTDOOR SUBSTATION UPGRADE
ELECTRICAL

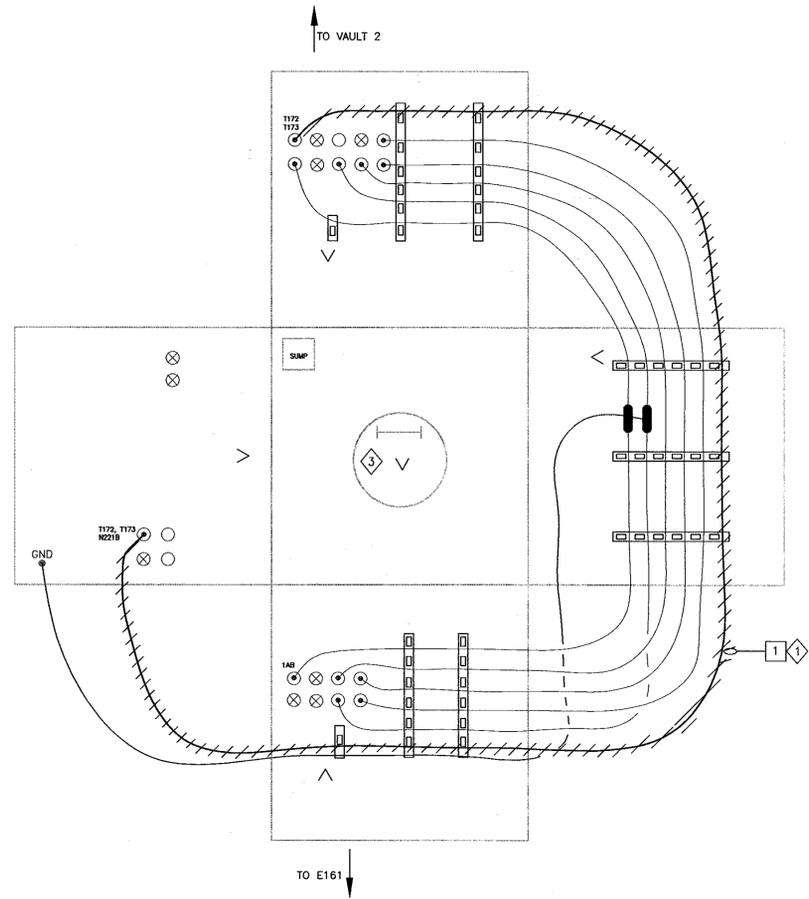
VAULT # 2 DETAILS
EXISTING/DEMOLITION & NEW WORK

SIZE D CAGE CODE 25307
SCALE: NONE INDEX SHEET 2 OF 2

FILE NAME: A1---0810-E064_2_RB.DWG 4-30-09

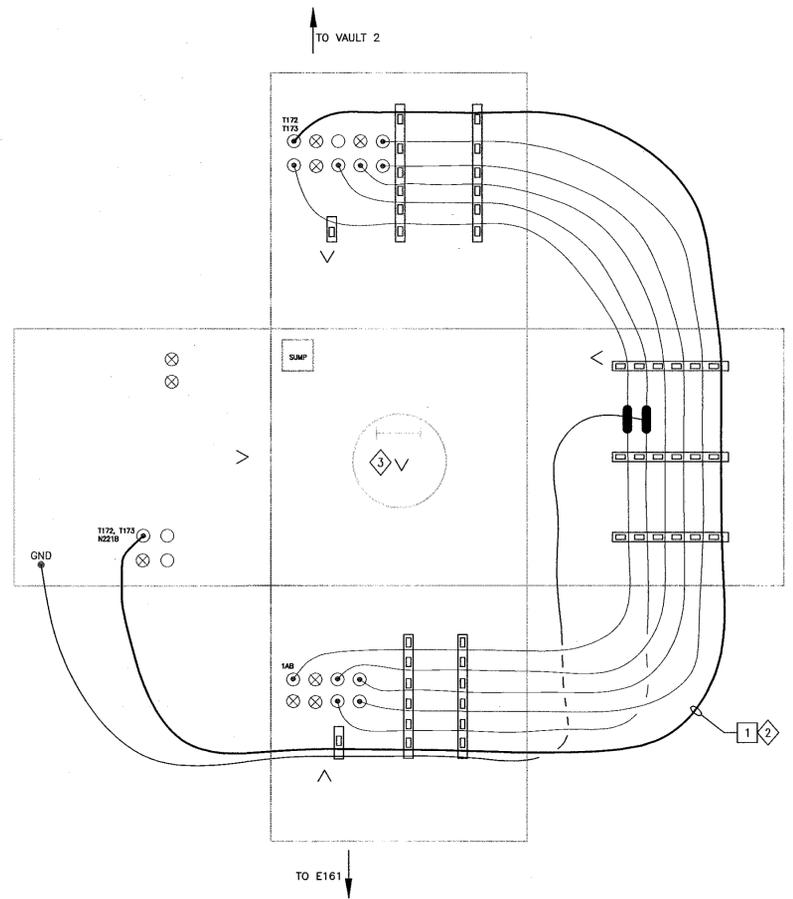
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 DATE: Apr 29, 2009 - 9:26:06 am

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CABLE DESCRIPTION	
1	7.5kV, 3-1/C-350kCMIL

1 MANHOLE NO. E160 DETAIL - EXISTING/DEMOLITION
SCALE: NTS (S.W. OF N225 SUBSTATION)



CABLE DESCRIPTION	
1	15kV, 3-1/C-350 kCMIL, 133%INS., EPR CABLE & 1/C #4 GND

2 MANHOLE NO. E160 DETAIL - NEW WORK
SCALE: NTS (S.W. OF N225 SUBSTATION)

ADDITIVE 2

SHEET NOTES

- SHEET NOTES #1,2,3 ARE NOT PART OF THIS CONTRACT (THE INTENTION IS FOR NASA 'IN-HOUSE' USE).
- THIS DRAWING IS NOT THE CONTROLLED NASA AMES CONFIGURATION MANAGEMENT BASELINE DRAWING.
- THE AMES CONFIGURATION MANAGEMENT BASELINE DRAWING THAT WAS USED TO CREATE THE PROJECT DRAWING IS A1---9801-E160.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON DRAWING.
- HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED, U.O.N.
- CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS AT THE SITE AND SHALL BE RESPONSIBLE FOR THEIR ACCURACY PRIOR TO STARTING ANY WORK OR ORDERING ANY MATERIAL.
- UPON COMPLETION OF CABLE WORK AND PRIOR ENERGIZATION, CONTRACTOR SHALL INFORM GOVERNMENT FOR TAKING AS-BUILT PHOTOS AND UPDATING OF NASA REFERENCE DWG.
- FOR N221B COVERED SUBSTATION SITE PLAN - EXISTING/DEMO AND NEW WORK SEE DRAWING E57.
- LIGHT LINES INDICATE EXISTING CONDITION AND DARK LINES INDICATE NEW WORK.
- NEW CABLE ROUTING INSIDE THE MANHOLE IS SHOWN DIAGRAMMATICALLY. EXACT CABLE ROUTING INSIDE MANHOLE SHALL BE IN ACCORDANCE WITH DWG E86.

KEY NOTES

- DISCONNECT AND REMOVE EXISTING CABLE FROM SWITCH 454 TO N221B SUBSTATION ACB 590 SWITCHGEAR VIA VAULT #2 & MH E160.
- PROVIDE 15kV, 3-1/C-350kCMIL, 133% INS., EPR CABLE AND 1/C #4 GND TO VCB 590. INSTALL FEEDER IDENTIFICATION TAG & PHASE IDENTIFICATION COLOR TAPE.
- MANHOLE OPENING SIZE: 36" DIA x 24" DEEP.
- ALL INFORMATION INCLUDED IN THIS DETAIL IS CONSIDERED AS EXISTING CONDITIONS BASED ON LATEST KNOWN EXISTING DRAWINGS.

NASA REFERENCE DRAWINGS

A1---9801-E160 UNDERGROUND POWER DISTRIBUTION MANHOLE E160 DETAIL.

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD																																
REVISIONS																																					
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DRAWN	N.NIZAMOVA	DATE	4.30.09																																		
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PROJECT	N.NIZAMOVA	DATE	4.30.09																																		
REQUESTER	N.HSU	DATE	4.30.09																																		
R&Q		DATE																																			
SAFETY		DATE																																			
SUPERVISOR	S.FRANKEL	DATE	5-5-09																																		
<p>Ames Research Center Moffett Field, California</p> <p>RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII N221B OUTDOOR SUBSTATION UPGRADE ELECTRICAL</p> <p>MHE160 DETAILS EXISTING/DEMOLITION & NEW WORK</p>																																					
SIZE		CAGE CODE		REV																																	
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SCALE: NONE		INDEX		SHEET 1 OF 1																																	

DWG: \\f19-m3\cadd\ARC\ARC\REDS\REDS Phase VIII\500_CAD\N221B_Outdoor_Substation_Upgrade - T172 and T173\Sheet\A1---0810-E065_1_RB.DWG Version: 17.1.s (LMS Tech) User: pdolan DATE: Apr 29, 2009 - 9:26:28 am

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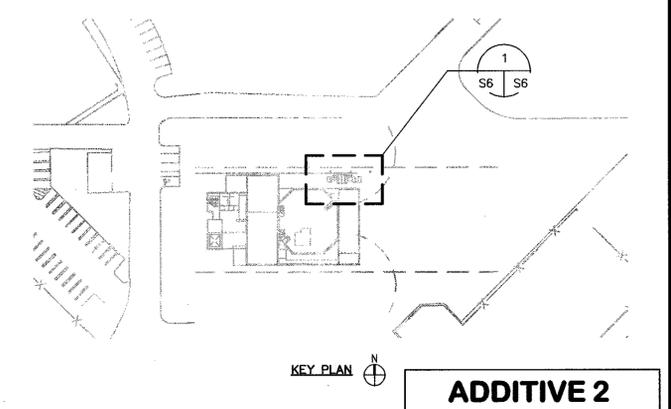
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 DATE: Apr 29, 2009 - 9:26:35 am

SHEET NOTES

1. FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4 AND S1.
2. LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
3. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
4. CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.

KEY NOTES

- ① 1/2"Ø HILTI HIT RE-500-SD ADHESIVE ANCHOR W/MIN 6" EMBEDMENT, 4 PER CABINET OR TRANSFORMER.
- ② (E) CONC PAD.



ADDITIVE 2

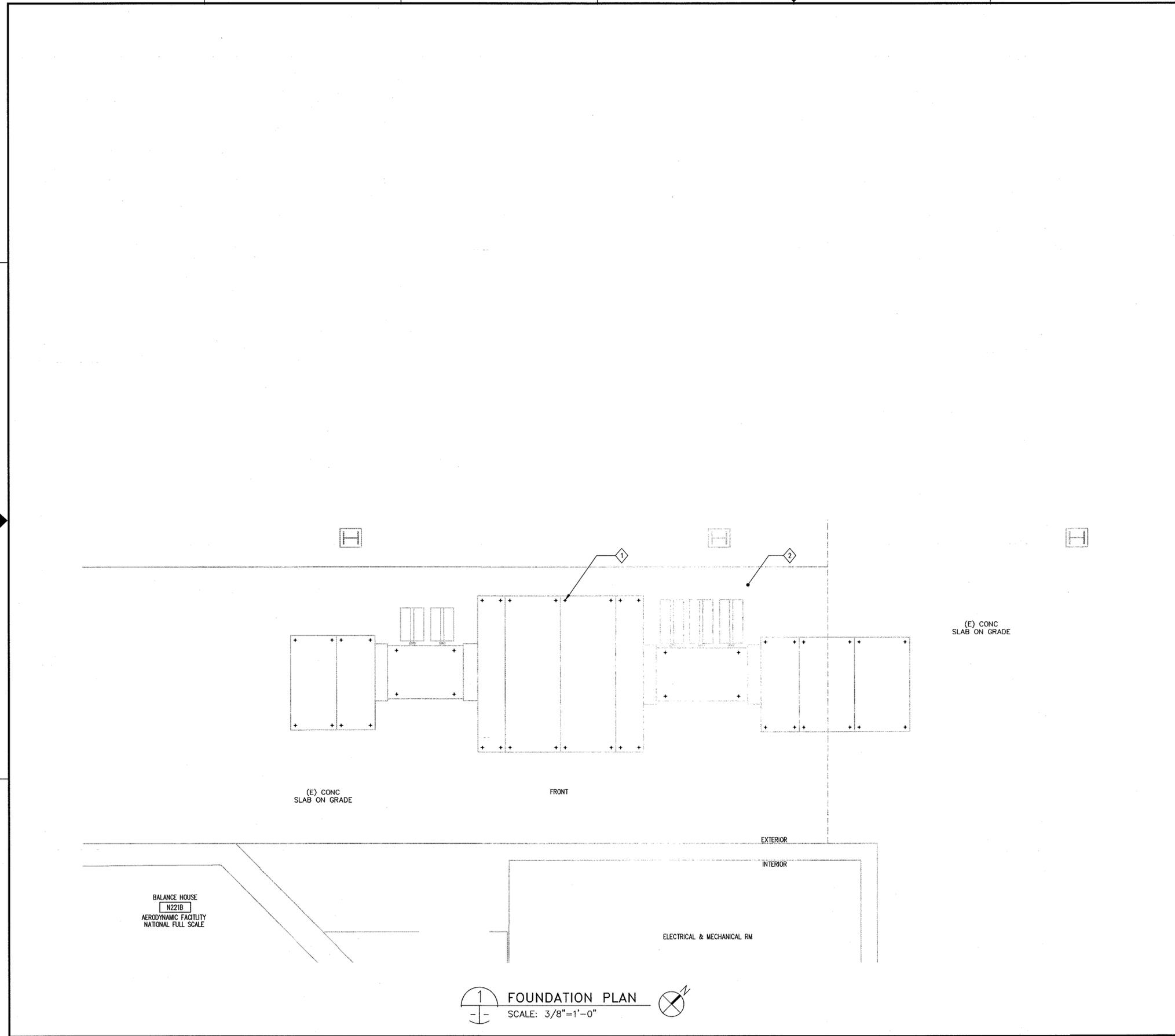
Approved for Construction
 Moffett Field Permit Board
[Signature]
 Chief Building Official
 Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN P. ALDEN	DATE 4/20/09
DESIGNED A. FIROUZI	DATE 4/20/09
CHECKED L. Z. F. F. F.	DATE 4/21/09
PROGRAMMER N. NIZAMOVA	DATE 4/30/09
REQUESTER N. HSJ	DATE 4/20/09
R&QA	DATE
SAFETY	DATE
SUPERVISOR S. FRANKEL	DATE 5-15-09

Ames Research Center
 Moffett Field, California
 RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM—PHASE VIII
 N221B OUTDOOR SUBSTATION UPGRADE
 STRUCTURAL
FOUNDATION PLAN

SIZE D	CAGE CODE 25307	INDEX	SHEET OF
SCALE: AS NOTED	FILE NAME: A1---0810-S006_L1_RB.DWG	DATE: 4-30-09	



① FOUNDATION PLAN
 SCALE: 3/8"=1'-0"

60046720.0001

SHEET NOTES

- FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS, SEE DRAWING G4.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON THE DRAWING.
- SINGLE LINE DIAGRAM IS BASED ON THE LATEST KNOWN EXISTING DRAWINGS.
- HATCHED LINES INDICATE EXISTING MATERIAL AND EQUIPMENT TO BE DEMOLISHED/ REMOVED, U.O.N.
- PRIOR TO SHUTDOWN AND DEMOLITION WORK, CONTRACTOR SHALL PERFORM PHASE SEQUENCE TEST ON EXISTING SYSTEM IN THE PRESENCE OF THE CONTRACTING OFFICER. ALL DISCONNECTED CABLES THAT ARE TO REMAIN SHALL BE PROPERLY IDENTIFIED, TAGGED FOR RESTORATION IN NEW WORK.

KEY NOTES

- REMOVE EXISTING PRIMARY SWITCHGEAR AND CIRCUIT BREAKER VCB077 AND ALL ASSOCIATED EQUIPMENT & DEVICES.
- DISCONNECT & PULL BACK EXISTING INCOMING CABLES FOR RECONNECTION IN NEW WORK.
- DISCONNECT AND REMOVE EXISTING CABLE BETWEEN VCB077 AND TRANSFORMER T13.
- REMOVE ALSTOM RELAY AND PROTECT FROM DAMAGE FOR REINSTALLATION IN NEW WORK.
- REMOVE DIGITAL POWER METER AND PROTECT FROM DAMAGE FOR REINSTALLATION IN NEW SWITCHGEAR. DISCONNECT AND PULL OUT WIRES BACK TO COMMUNICATION PANEL LOCATED IN COMMUNICATION ROOM # D117 ON THE FIRST FLOOR AND PROTECT FROM DAMAGE FOR RECONNECTION IN NEW WORK. SEE KEY PLAN ON DRAWING E74 FOR LOCATION OF COMMUNICATION ROOM.

NASA REFERENCE DRAWINGS:

A1---5805-E30 SYSTEM A & B SINGLE LINE DIAGRAM
 A1---6303-E33 SINGLE LINE DIAGRAM

BASE BID

Approved for Construction
 Moffett Field Permit Board
[Signature]
 Chief Building Official
 Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	N.NIZAMOVA	DATE	4/30/09
DESIGNED	N.NIZAMOVA	DATE	4/30/09
CHECKED	J.MCCUSKER	DATE	4/30/09
PROJECT	N.NIZAMOVA	DATE	4/30/09
REQUESTER	N.HSU	DATE	4/30/09
R&Q		DATE	
SAFETY		DATE	
SUPERVISOR	S.FRANKEL	DATE	5/25/09

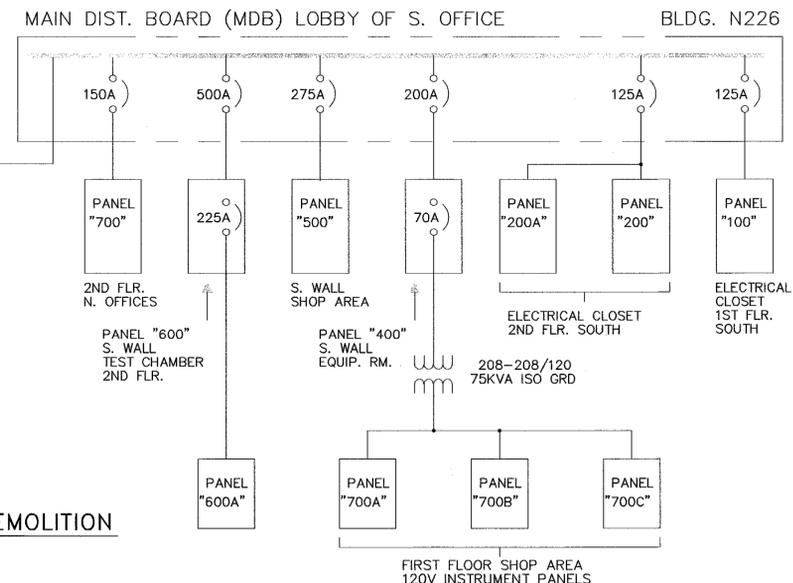
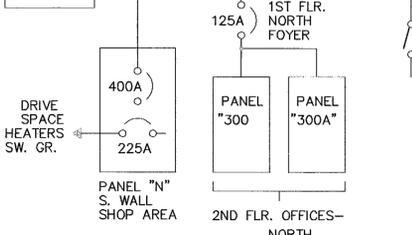
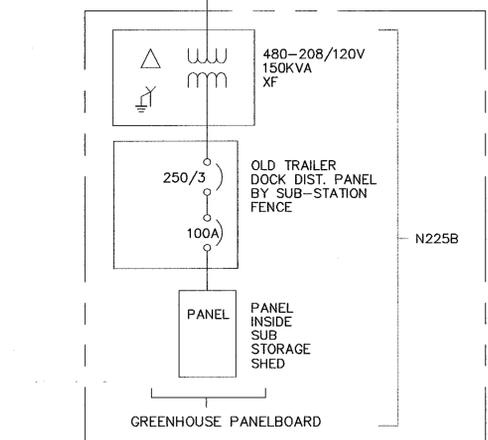
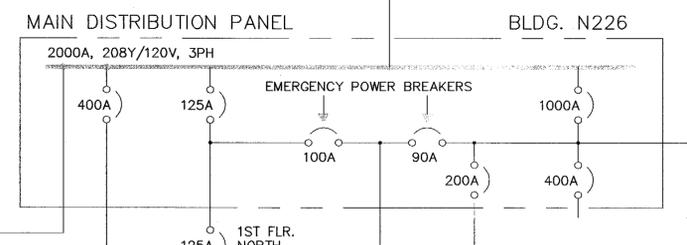
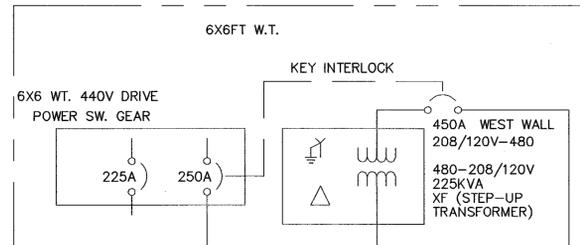
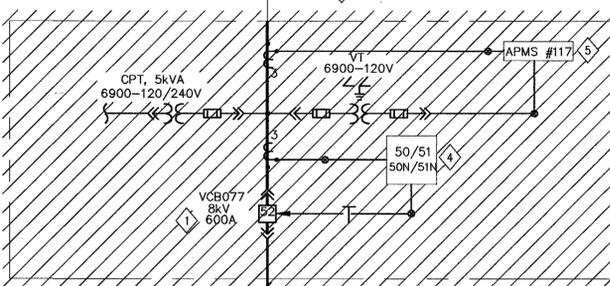
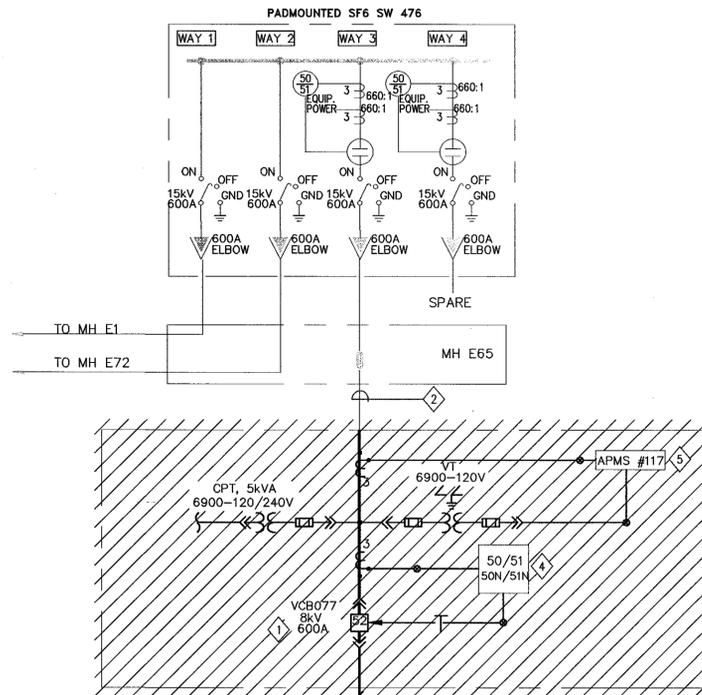
Ames Research Center
 Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
 N226 INDOOR SUBSTATION UPGRADE
 ELECTRICAL

ONE LINE DIAGRAM EXISTING/DEMOLITION

SIZE	D	CAGE CODE	25307
SCALE	NONE	INDEX	
SHEET		1 OF 1	

FILE NAME:
 A1---0810-E70_L1_R8.DWG 4-30-09



ONE LINE DIAGRAM - EXISTING/DEMOLITION
 SCALE: N.T.S.

DWG: \\F19-m3\oad\ARC\REDS\REDS\N226_Indoor_Substation_Upgrade - Switchgear\Sheet\A1---0810-E70_L1_R8.DWG User: pdalen
 DATE: Apr 29, 2009 9:28:41 am

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8

7

6

5

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DWG NO. A1---0810-E71

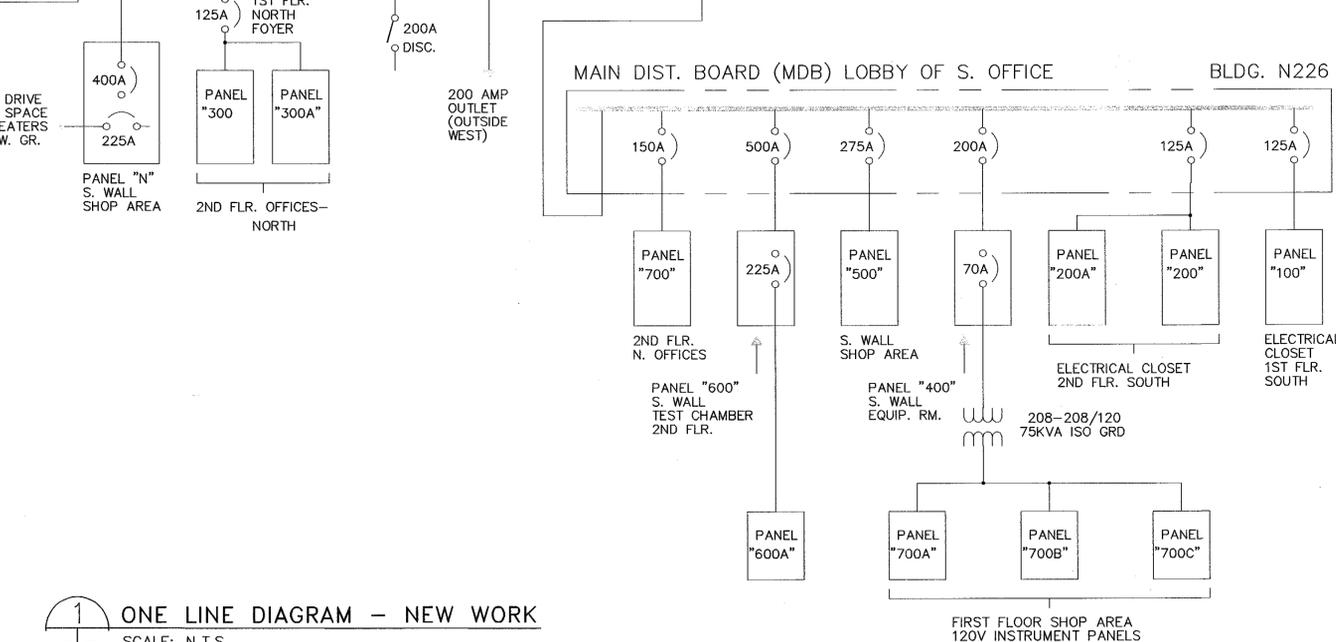
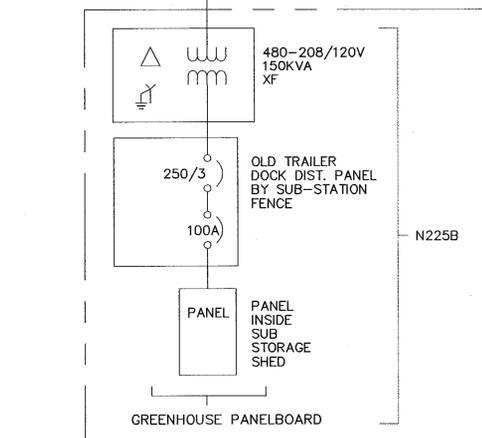
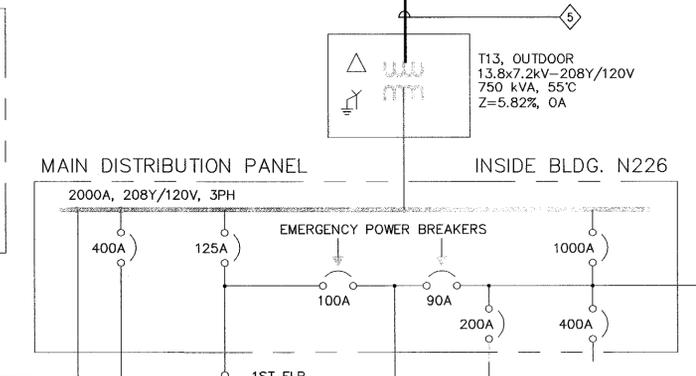
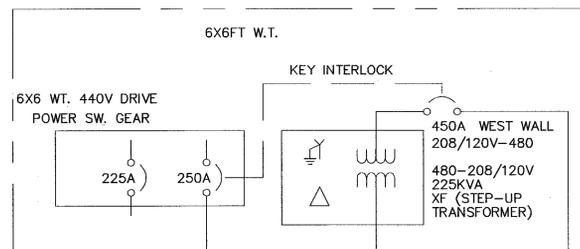
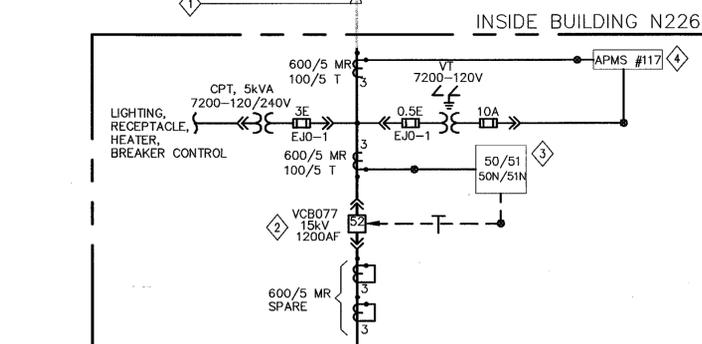
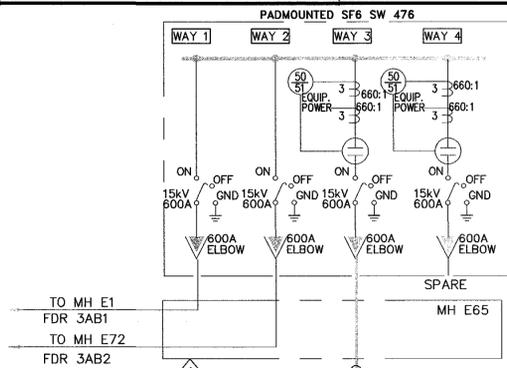
SHT 1 REV

SHEET NOTES

- FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS, SEE DRAWING G4.
- SINGLE LINE DIAGRAM IS BASED ON THE LATEST KNOWN EXISTING NASA DRAWING.
- LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
- ALL INDOOR EQUIPMENT TO BE RATED FOR USE IN NEMA 12 ENVIRONMENT, MINIMUM.
- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON DWG.
- DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- THE DIAGRAM IS PROVIDED FOR GUIDANCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT INCLUDING TERMINAL BLOCKS, TERMINAL IDENTIFICATION NUMBER, CONNECTIONS ETC. AND REVISE DRAWINGS AS NEEDED TO MATCH EXISTING AND NEW EQUIPMENT TO PROVIDE A COMPLETE FUNCTIONAL SYSTEM.
- ALL CT WIRES SHALL BE #10 AWG MINIMUM, TYPE SIS.
- ALL VOLTAGE, CPT SECONDARY AND BREAKER TRIP WIRES SHALL BE #12 AWG MINIMUM, TYPE SIS. U.O.N.
- CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING.
- CPT AND VT'S SHALL BE DRAWOUT TYPE.
- SEE DRAWING E77 FOR THREE LINE DIAGRAM AND E78 FOR BREAKER CONTROL DIAGRAM. SEE DRAWING E80 FOR NAMEPLATE SCHEDULE.

KEY NOTES

- RECONNECT EXISTING CABLE TO NEW VCB077. EXTEND AS NECESSARY.
- PROVIDE 15kV, 1200A SWITCHGEAR WITH VACUUM CIRCUIT BREAKER VCB077, CPT, VT AND ALL ACCESSORIES PER SPECIFICATION SECTION 26 13 00.00 20.
- REINSTALL ALSTOM RELAY REMOVED FROM (E) SWITCHGEAR AND COMPLETELY WIRE IT INTO THE NEW EQUIPMENT. INSTALLATION SHALL BE IN ACCORDANCE WITH DRAWINGS E81 & E85.
- REINSTALL DIGITAL POWER METER REMOVED FROM (E) SWITCHGEAR AND COMPLETELY WIRE IT INTO THE NEW SWITCHGEAR. INSTALLATION SHALL BE IN ACCORDANCE WITH DRAWING E85. SEE KEY NOTE 2 ON DRAWING E74 FOR CONNECTION DETAILS.
- PROVIDE 15kV, 3-1/C-350KCMIL, 133% INS., EPR CABLE AND 1/C #4 GND FROM VCB077 TO OUTDOOR TRANSFORMER T13.



BASE BID

Approved for Construction
Moffett Field Permit Board
Peter...
Chief Building Official
Permit No. 09Q038

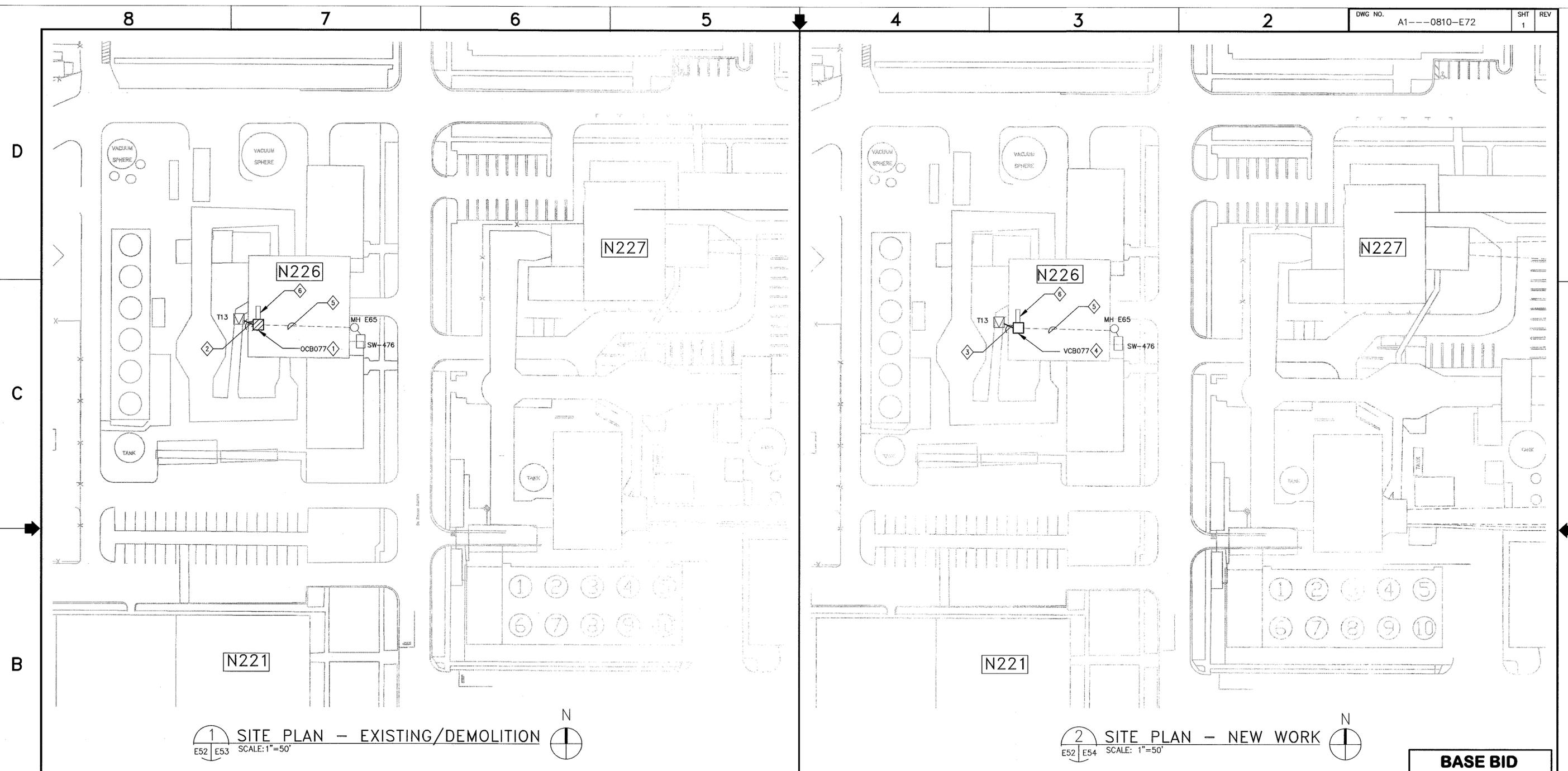
ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD

DESIGNED		DATE		 Ames Research Center Moffett Field, California
N.NIZAMOVA	4/30/09			
CHECKED		DATE		RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII N226 INDOOR SUBSTATION UPGRADE ELECTRICAL ONE LINE DIAGRAM NEW WORK
J.MOCUSKER	4/30/09			
REQUESTED		DATE		
N.NIZAMOVA	4/30/09			
SUPERVISOR		DATE		SIZE: 25307 SCALE: NONE
S.FRANKEL	5-1-09			SHEET 1 OF 1 FILE NAME: A1---0810-E071_1_R8.DWG 4-30-09

1 ONE LINE DIAGRAM - NEW WORK
SCALE: N.T.S.

DWG: \\F:\19-103\cadd\ACD\ACD\REDIS\REDIS Phase VII\500_CAD\N226_Indoor Substation Upgrade - Switchgear\Sheet\A1---0810-E071_1_R8.DWG
 Date: Apr 29, 2009 9:28:44 am
 Version: 17.1s (LMS Tech) User: piciden

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1 SITE PLAN - EXISTING/DEMOLITION
E52 E53 SCALE: 1"=50'

2 SITE PLAN - NEW WORK
E52 E54 SCALE: 1"=50'

BASE BID

SHEET NOTES

- NOT ALL CONDUITS ARE SHOWN ON THE DRAWING.
- HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED U.O.N.
- CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS AT THE SITE AND SHALL BE RESPONSIBLE FOR THEIR ACCURACY PRIOR TO STARTING ANY WORK OR ORDERING ANY MATERIAL.

KEY NOTES

- DISCONNECT AND REMOVE (E) SWITCHGEAR VCB077 AND ALL ACCESSORIES.
- DISCONNECT & REMOVE EXISTING CABLES FROM VCB077 TO TRANSFORMER T13. EXISTING UNDERGROUND DUCTS TO REMAIN AND TO BE RE-USED IN NEW WORK.
- PROVIDE NEW 15KV, 3-1/C 350KCMIL, 133% INS., EPR CABLE AND 1/C #4 GND FROM VCB077 TO TRANSFORMER T13 IN (E) CONDUITS.
- PROVIDE 15KV, 1200A SWITCHGEAR WITH VACUUM CIRCUIT BREAKER VCB77, OPT, VT AND ALL ACCESSORIES PER SPECIFICATION SECTION 26 13 00.00 20.
- EXISTING 15KV CABLE TO REMAIN.
- (E) 208Y/120V MAIN DISTRIBUTION PANEL TO REMAIN.

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Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DESIGNED	N.NIZAMOVA	DATE	4.30.09		
DESIGNED	N.NIZAMOVA	DATE	4.30.09		
CHECKED	J.MCCUSKER	DATE	4.30.09		
PREPARED	N.NIZAMOVA	DATE	4.30.09		
REQUESTER	N.HSU	DATE	4.30.09		
R&QA		DATE			
SAFETY		DATE			
SUPERVISOR	S.FRANKEL	DATE	5-2-09		

Ames Research Center
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RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM—PHASE VIII
N226 INDOOR SUBSTATION UPGRADE
ELECTRICAL

**SITE PLANS - EXISTING/
DEMOLITION & NEW WORK**

SIZE	D	CAGE CODE	25307	REV	
SCALE:	AS SHOWN	INDEX		SHEET	1 OF 1

FILE NAME:
A1---0810-E72_1_RB.DWG 4-30-09

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 DATE: Apr 29, 2009 - 8:26:49 am

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DWG NO. A1---0810-E73

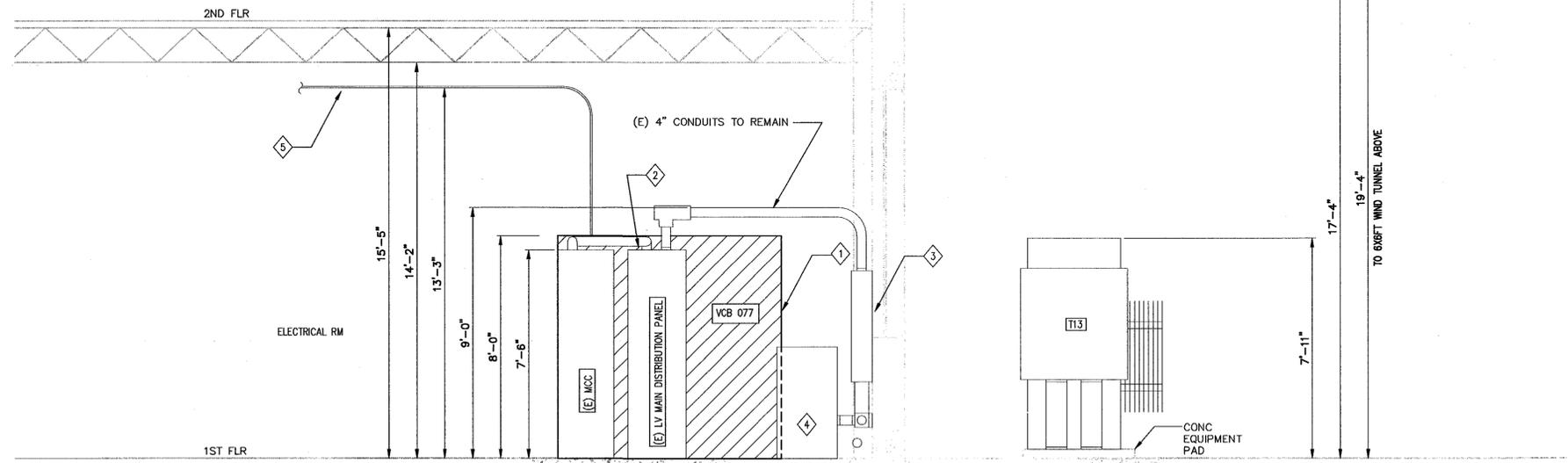
SHT REV

SHEET NOTES

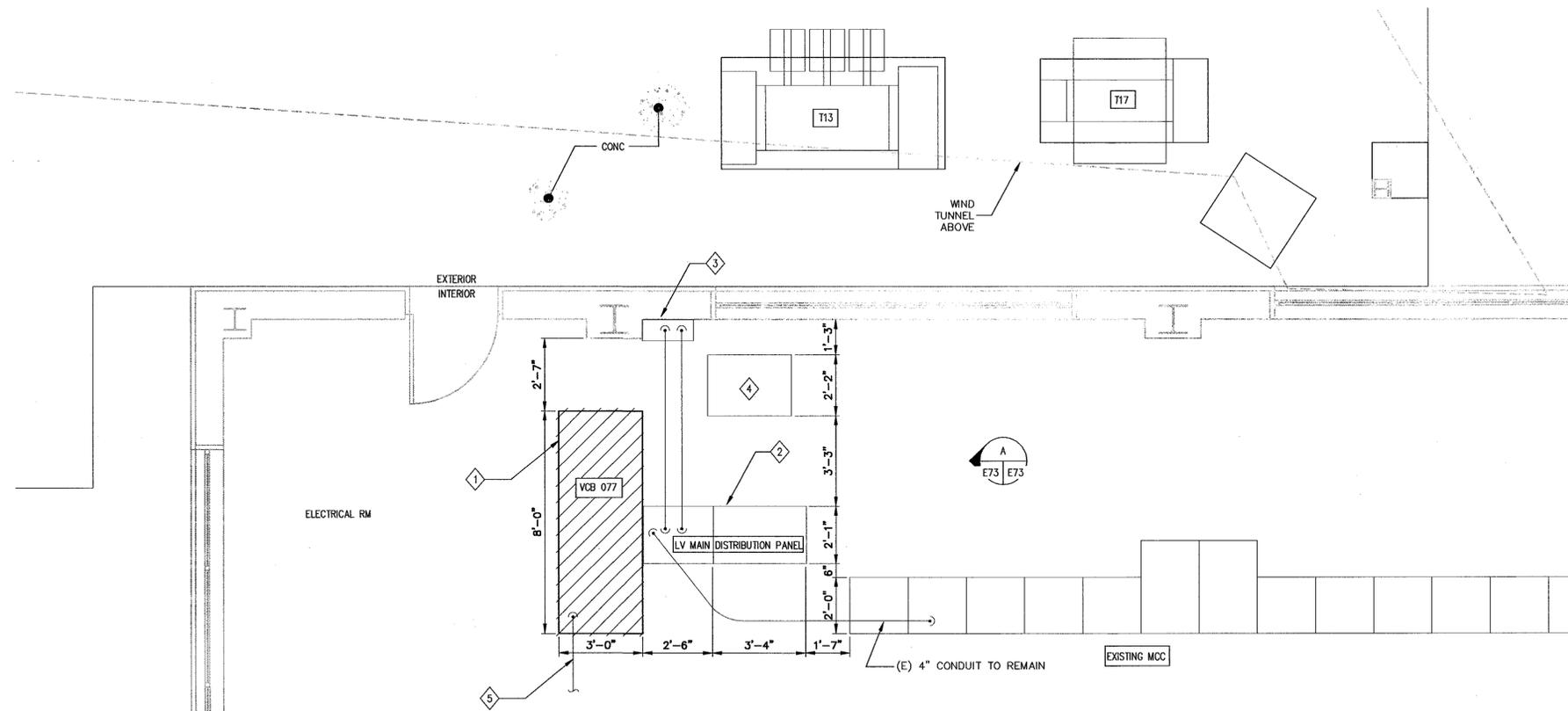
- FOR GENERAL CONSTRUCTION NOTES, SYMBOLS AND ABBREVIATIONS SEE DRAWING G4.
- HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED U.O.N.
- ALL EXISTING CONDUITS AND CONDUCTORS SHALL BE DISCONNECTED FROM (E) EQUIPMENT AND RECONNECTED TO NEW EQUIPMENT, CONTRACTOR SHALL DETERMINE IN FIELD AND PROVIDE PULL BOXES AND RELOCATE/EXTEND OR REPLACE (E) CONDUITS AND CONDUCTORS (MATCH EXISTING SIZE) TO COMPLETE CONNECTIONS TO NEW AND EXISTING EQUIPMENT.
- EXISTING GROUNDING SYSTEM TO REMAIN FOR RECONNECTION IN NEW WORK.
- PRIOR TO SHUTDOWN AND DEMOLITION WORK, CONTRACTOR SHALL PERFORM PHASE SEQUENCE TEST ON EXISTING SYSTEM/EQUIPMENT IN THE PRESENCE OF COTR.

KEY NOTES

- 1 REMOVE EXISTING PRIMARY SWITCHGEAR AND CIRCUIT BREAKER VCB077 AND ALL ASSOCIATED EQUIPMENT AND DEVICES.
- 2 EXISTING 208Y/120V MAIN DISTRIBUTION PANEL TO REMAIN.
- 3 EXISTING SWITCH FOR TRAILER DOCK NORMAL POWER TO REMAIN.
- 4 EXISTING 225 kVA, 208Y/120V TRANSFORMER TO REMAIN.
- 5 DISCONNECT AND PULL OUT WIRES BACK TO COMMUNICATION PANEL LOCATED IN COMMUNICATION ROOM # D117 ON THE FIRST FLOOR AND PROTECT FROM DAMAGE FOR RECONNECTION IN NEW WORK. (E) CONDUIT TO REMAIN AND TO BE USED IN NEW WORK. SEE KEY PLAN ON DRAWING E74 FOR LOCATION OF COMMUNICATION ROOM.



EQUIPMENT ELEVATION - DEMOLITION
SCALE: 3/8"=1'-0"



EQUIPMENT PLAN - DEMOLITION
SCALE: 3/8"=1'-0"

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ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	N.NIZAMOVA	DATE	4.30.09
DESIGNED	N.NIZAMOVA	DATE	4.30.09
CHECKED	J.MCCLUSKER	DATE	4.30.09
PROGRAMR	N.NIZAMOVA	DATE	4.30.09
REQUESTER	N.HSU	DATE	4.30.09
R&DA		DATE	
SAFETY		DATE	
SUPERVISOR	S.FRANKEL	DATE	5.2.09

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM—PHASE VII
N226 INDOOR SUBSTATION UPGRADE
ELECTRICAL

**EQUIPMENT PLAN AND ELEVATION
EXISTING/DEMOLITION**

SIZE	D	CAGE CODE	25307
SCALE	AS NOTED	INDEX	
FILE NAME:	A1---0810-E73_1_RB.DWG		
	4-30-09		

DWG: \\F19-r13\cadd\ARC\REDS\REDS Phase VIII_500_DAO\N226_Indoor Substation Upgrade - Switchgear\Sheet\A1---0810-E73_1_RB.DWG Version: 17.1s (MS Tech) User: paden
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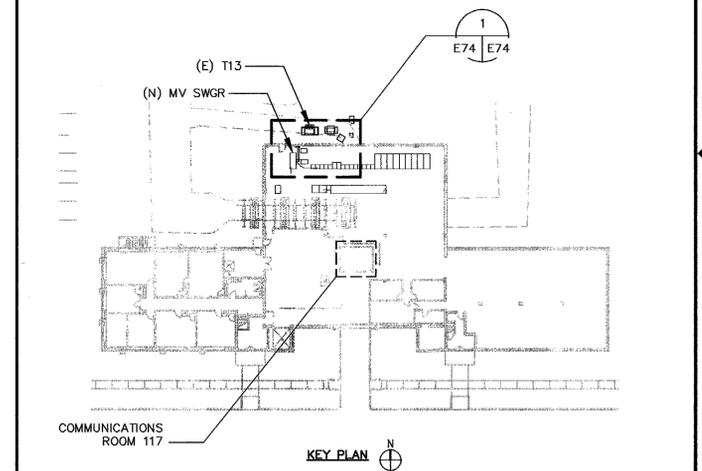
60046720.0001

SHEET NOTES

- FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4.
- LIGHT LINES DENOTE EXISTING MATERIAL/ EQUIPMENT TO REMAIN.
- DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT RATING PRIOR TO ORDERING ANY MATERIALS.
- ALL EXISTING CONDUITS AND CONDUCTORS SHALL BE RECONNECTED TO NEW EQUIPMENT. CONTRACTOR SHALL DETERMINE IN FIELD AND PROVIDE PULL BOXES AND RELOCATE/EXTEND OR REPLACE (E) CONDUITS AND CONDUCTORS (MATCH EXISTING SIZE) TO COMPLETE CONNECTIONS TO NEW AND EXISTING EQUIPMENT.

KEY NOTES

- PROVIDE 15kV, 1200A VACUUM CIRCUIT BREAKER SWITCHGEAR VCB077 INCLUDING CPT, VT AND ALL ACCESSORIES PER SPECIFICATION SECTION 26 13 00.00 20.
- PROVIDE NEW CAT 5E WIRES IN EXISTING CONDUIT IF EXISTING WIRES ARE NOT LONG ENOUGH FOR RECONNECTION. NO SPLICES ON THESE WIRES! PROVIDE ADDITIONAL 25 FEET OF CABLE AND RJ-45 CONNECTORS AT EACH END. ETHERNET CABLE HOOK UP TO COMMUNICATION PANEL AND APMS WILL BE PERFORMED BY OTHERS. APPROXIMATE DISTANCE IS 180 FEET. SEE KEY PLAN THIS DRAWING FOR COMMUNICATION ROOM LOCATION.
- CONNECT NEW EQUIPMENT TO EXISTING GROUNDING SYSTEM WITH #4/0 AWG COPPER GROUND CONDUCTOR.



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ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DRAWN	N.NIZAMOVA	4.30.09			
DESIGNED	N.NIZAMOVA	4.30.09			
CHECKED	J.MCCUSKER	4.30.09			
PROJ.MGR	N.NIZAMOVA	4.30.09			
REQUESTER	N.HSU	4.29.09			
R&QA					
SAFETY					
SUPERVISOR	S.FRANKEL	5-8-09			

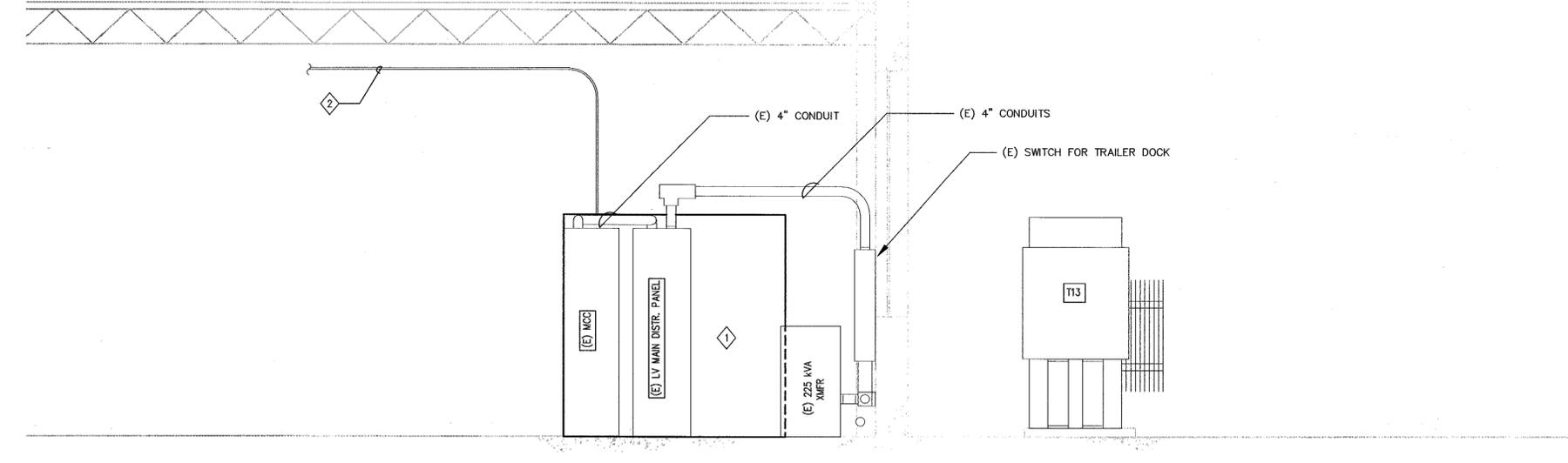
Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM—PHASE VIII
N226 INDOOR SUBSTATION UPGRADE
ELECTRICAL

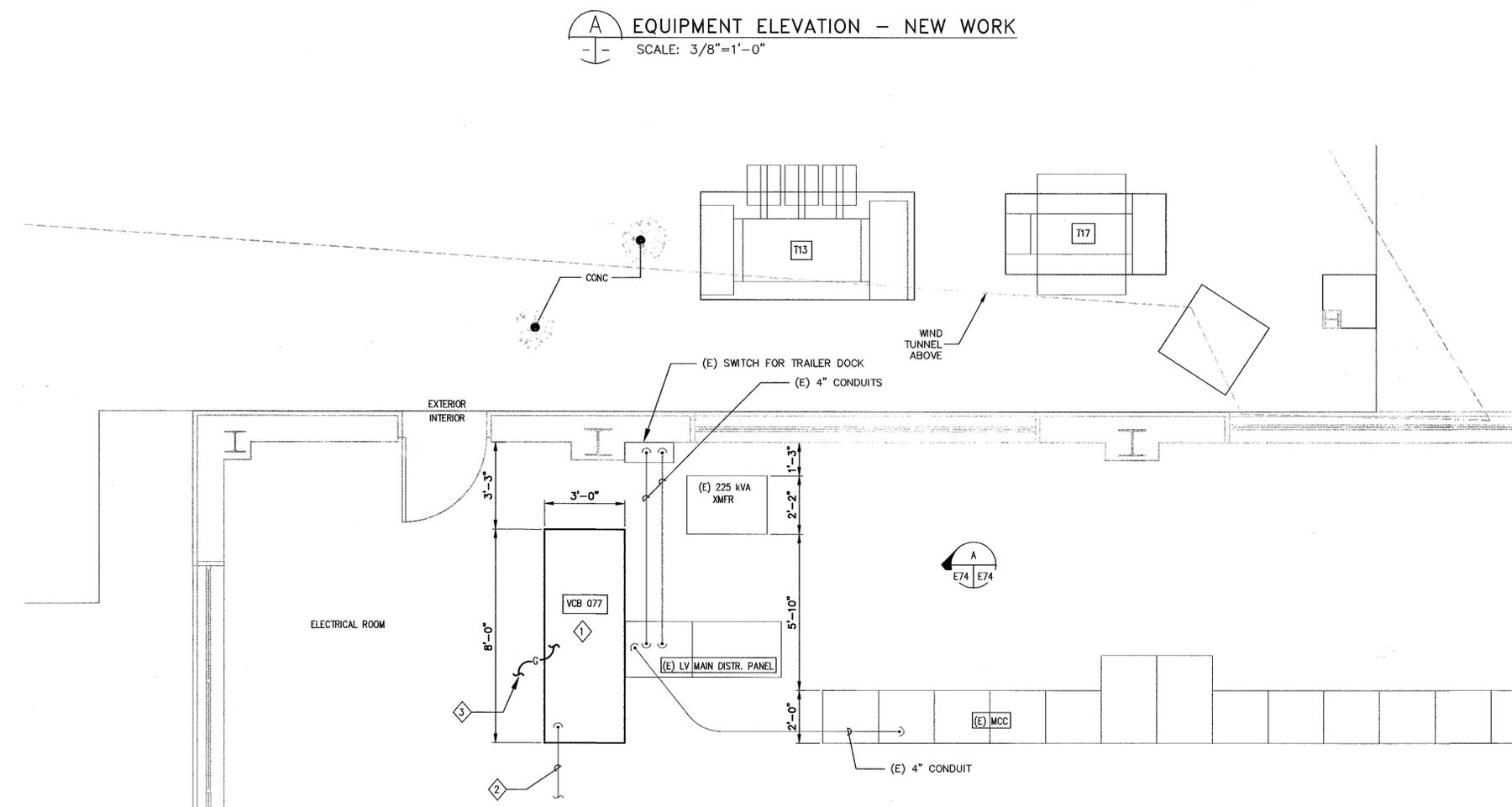
**EQUIPMENT PLAN AND ELEVATION
NEW WORK**

SIZE	D	CAGE CODE	25307	SCALE	AS NOTED	INDEX	SHEET	OF
FILE NAME:	A1---0810-E074_1_R8.DWG 4-30-09							

1 EQUIPMENT ELEVATION - NEW WORK
SCALE: 3/8"=1'-0"



1 EQUIPMENT PLAN - NEW WORK
SCALE: 3/8"=1'-0"



DWG: \\f19-m3\cadd\ARC\ARC\REDS\REDS Phase VIII\500_CAD\N226_indoor Substation Upgrade - Switchgear\Sheet\A1---0810-E074_1_R8.DWG User: pdclan
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DWG NO. A1---0810-E75

SHT REV

SHEET NOTES

- 1. HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED. U.O.N.
- 2. REFER TO DRAWING E53 FOR EQUIPMENT LAYOUT.

KEY NOTES

- 1 REMOVE EXISTING PRIMARY SWITCHGEAR AND CIRCUIT BREAKER VCB077 AND ALL ASSOCIATED EQUIPMENT AND DEVICES.
- 2 EXISTING 208Y/120V MAIN DISTRIBUTION PANEL TO REMAIN.
- 3 EXISTING SWITCH FOR TRAILER DOCK NORMAL POWER TO REMAIN.
- 4 EXISTING 225 kVA, 208Y/120V TRANSFORMER TO REMAIN.
- 5 EXISTING MCC TO REMAIN.
- 6 EXISTING 13.8X7.2KV-208Y/120V, 750kV TRANSFORMER T13 TO REMAIN.
- 7 DISCONNECT (E) 3/4" CONDUIT FROM (E) SWITCHGEAR. DISCONNECT AND PULL OUT WIRES BACK TO COMMUNICATION PANEL LOCATED IN COMMUNICATION ROOM # D117 ON THE FIRST FLOOR AND PROTECT FROM DAMAGE FOR RECONNECTION IN NEW WORK. SEE KEY PLAN ON DRAWING E74 FOR COMMUNICATION ROOM LOCATION.

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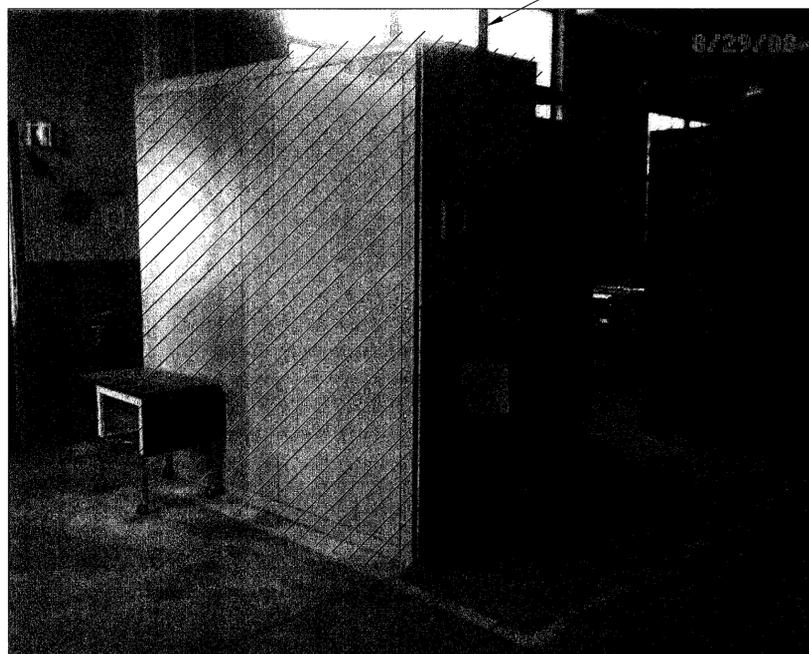
A



1 (E) N226 SUBSTATION DETAIL
E74 | E75 SCALE:



2 (E) N226 SUBSTATION DETAIL
E74 | E75 SCALE:



3 (E) N226 SUBSTATION DETAIL
E74 | E75 SCALE:

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Moffett Field Permit Board
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Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN N.NIZAMOVA	DATE 4.30.09
DESIGNED N.NIZAMOVA	DATE 4.30.09
CHECKED J.MCCUSKER	DATE 4.30.09
PROJECTOR N.NIZAMOVA	DATE 4.30.09
REQUESTER N.HSU	DATE 4/20/09
R&QA	DATE
SAFETY	DATE
SUPERVISOR S.FRANKEL	DATE 5-5-09

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM—PHASE VIII
N226 INDOOR SUBSTATION UPGRADE
ELECTRICAL

MISCELLANEOUS PHOTO DETAILS
EXISTING/DEMOLITION

SIZE D	DATE 5-5-09	SCALE: AS NOTED	INDEX	SHEET 1 OF 1
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FILE NAME:
A1---0810-E75_1_R8.DWG 4-30-09

DWG: \\F119-r13\cadd\ARC\REDS\Phase VIII\500_CAD\N226_Indoor Substation Upgrade - Switchgear\E\Sheet\A1---0810-E075_1_R8.DWG Version: 17.1s (LMS Tech) User: pccden
 DATE: Apr. 29, 2009 - 9:27:11 am

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 DATE: Apr 23, 2009 - 9:27:16 am

SHEET NOTES

- NOT ALL CONDUITS AND CONDUCTORS ARE SHOWN ON DWG.
- HATCHED LINES INDICATE EXISTING MATERIALS AND EQUIPMENT TO BE DEMOLISHED AND REMOVED.
- THE DIAGRAM IS PROVIDED FOR GUIDANCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT INCLUDING TERMINAL BLOCKS, TERMINAL IDENTIFICATION NUMBER, CONNECTIONS ETC. AND REVISE DRAWINGS AS NEEDED TO MATCH EXISTING AND NEW EQUIPMENT TO PROVIDE A COMPLETE FUNCTIONAL SYSTEM.

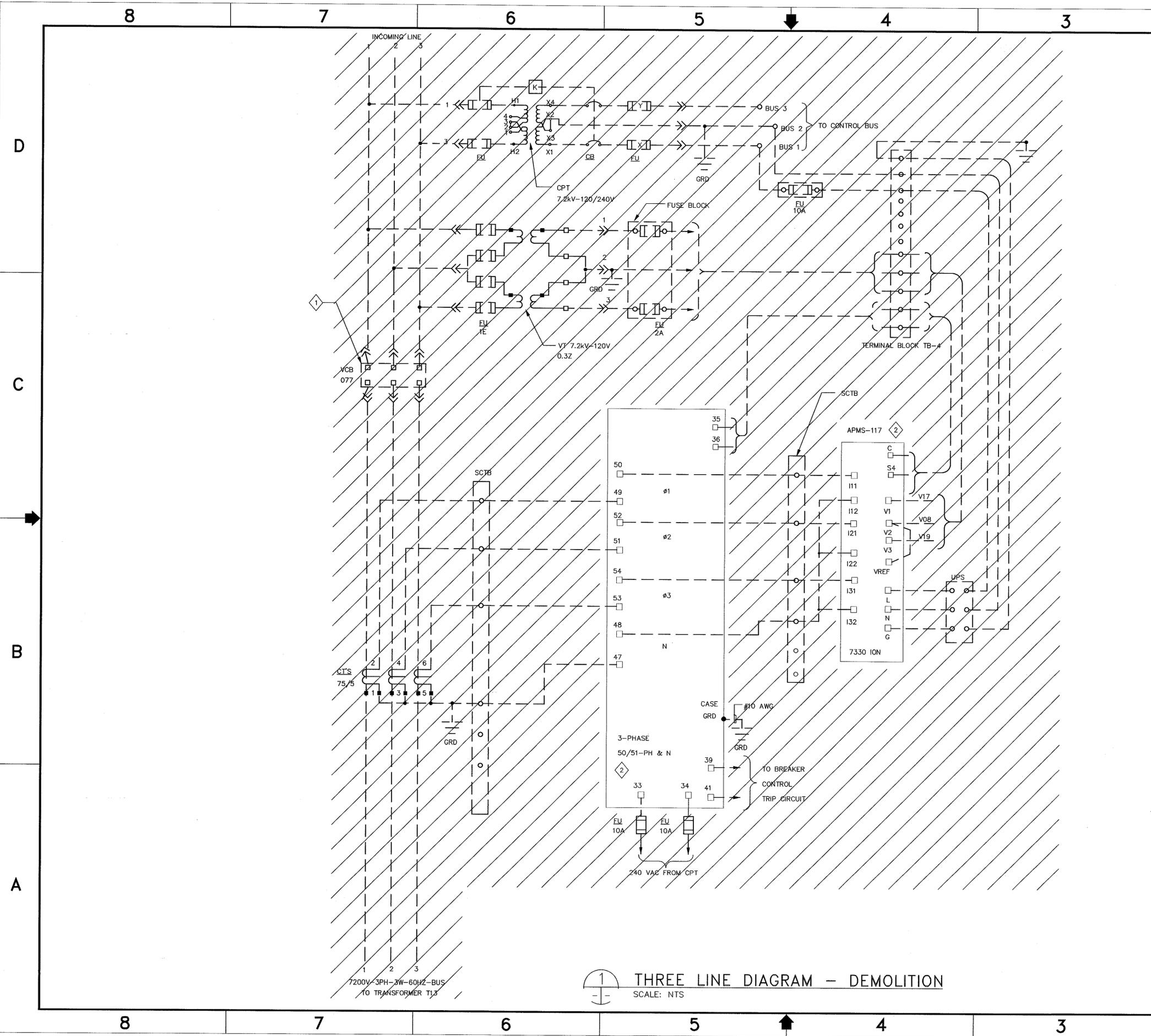
KEY NOTES

- DISCONNECT AND REMOVE EXISTING VCB SWITCHGEAR AND ALL ASSOCIATED DEVICES AND ACCESSORIES.
- REMOVE AND PROTECT FROM DAMAGE FOR REINSTALLATION IN NEW WORK.

BASE BID

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Moffett Field Permit Board
Nitz Nitz
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DRAWN	N.NIZAMOVA	DATE	4.22.09		
DESIGNED	N.NIZAMOVA	DATE	4.30.09		
CHECKED	J.McCUSKER	DATE	4.30.09		
PROJ MGR	N.NIZAMOVA	DATE	4.30.09		
REQUESTER	N.HSU	DATE	4/20/09		
R&GA		DATE			
SAFETY					
SUPERVISOR	S.FRANKEL	DATE	5-2-09		
SIZE	D	CAGE CODE	25307		
SCALE	NONE	INDEX			
Ames Research Center Moffett Field, California RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM--PHASE VIII N226 INDOOR SUBSTATION UPGRADE ELECTRICAL THREE LINE DIAGRAM DEMOLITION					
FILE NAME:	A1---0810-E76_L1_R8.DWG				
		SHEET	1	OF	1



THREE LINE DIAGRAM - DEMOLITION
 SCALE: NTS

D
C
B
A

D
C
B
A

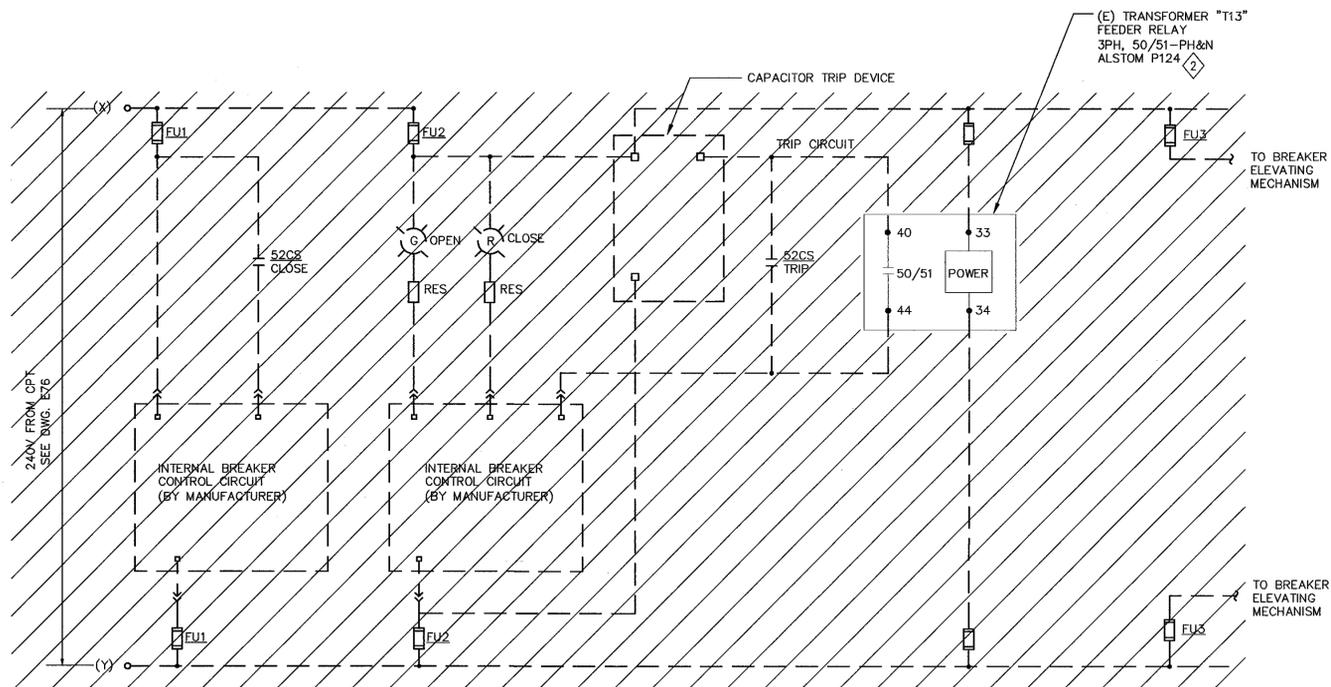
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SHEET NOTES

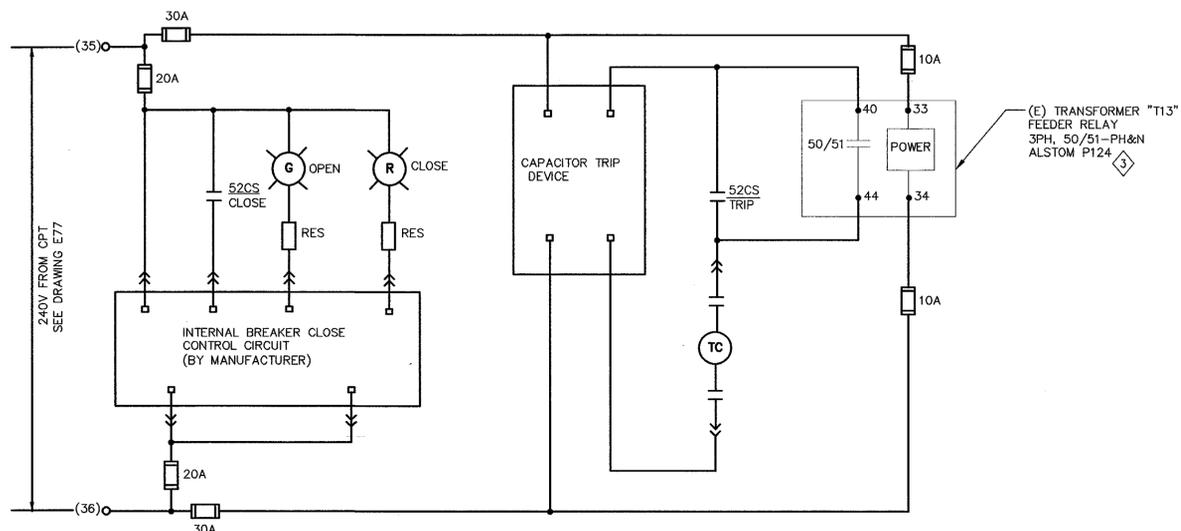
- 1. HATCHED LINES INDICATE EXISTING MATERIAL/EQUIPMENT TO BE DEMOLISHED AND REMOVED. U.O.N.
- 2. DARK OR HEAVY LINES INDICATE NEW MATERIAL/EQUIPMENT TO BE PROVIDED. U.O.N.
- 3. THE DIAGRAMS ARE PROVIDED FOR GUIDANCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT INCLUDING TERMINAL BLOCKS, TERMINAL IDENTIFICATION NUMBER, CONNECTIONS ETC. AND REVISE DRAWINGS AS NEEDED TO MATCH EXISTING AND NEW EQUIPMENT TO PROVIDE A COMPLETE FUNCTIONAL SYSTEM.
- 4. THE CONTROL DIAGRAMS ARE BASED ON THE LATEST KNOWN EXISTING DRAWINGS.
- 5. NEW TERMINAL MARKINGS ARE BASED ON CUTLER HAMMER INFORMATION.

KEY NOTES:

- 1 DISCONNECT AND REMOVE EXISTING VCB077 SWITCHGEAR INCLUDING ALL ASSOCIATED DEVICES AND ACCESSORIES.
- 2 REMOVE ALSTOM RELAY AND PROTECT FROM DAMAGE FOR REINSTALLATION IN NEW WORK.
- 3 REINSTALL ALSTOM RELAY REMOVED FROM (E) SWITCHGEAR AND COMPLETELY WIRE IT INTO THE NEW EQUIPMENT. INSTALLATION SHALL BE IN ACCORDANCE WITH DRAWINGS E81 & E85.
- 4 TYPICAL BREAKER CONTROL DIAGRAM WITH TRANSFORMER FEEDER RELAY. FOR SUBSTATION ONE LINE AND THREE LINE DIAGRAMS REFER TO DRAWINGS E71 AND E77 RESPECTIVELY.



1 VCB077 BREAKER CONTROL DIAGRAM - DEMOLITION
SCALE: NTS



2 VCB077 BREAKER CONTROL DIAGRAM - NEW WORK
SCALE: NTS

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ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	N.NIZAMOVA	DATE	4.30.09
DESIGNED	N.NIZAMOVA	DATE	4.30.09
CHECKED	J.MCJUSKER	DATE	4.30.09
PROJMGTR	N.NIZAMOVA	DATE	4.30.09
REQUESTER	N.HSU	DATE	4/30/09
R&QA		DATE	
SAFETY		DATE	
SUPERVISOR	S.FRANKEL	DATE	5-7-09

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM—PHASE VIII
N226 INDOOR SUBSTATION UPGRADE
ELECTRICAL

VCB077 BREAKER CONTROL
DIAGRAMS—DEMOLITION & NEW WORK

SIZE	D	CAGE CODE	25307	REV	
SCALE	NONE	INDEX		SHEET	1 OF 1

FILE NAME:
A1---0810-E078_1_RB.DWG 4-30-09

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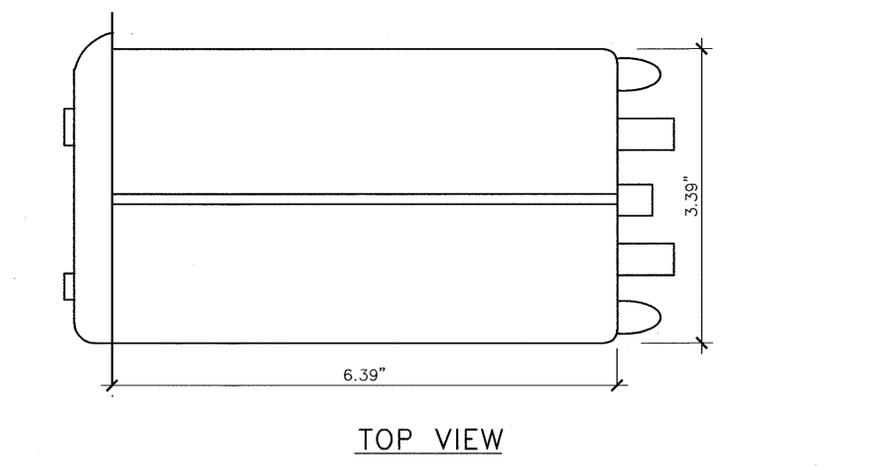
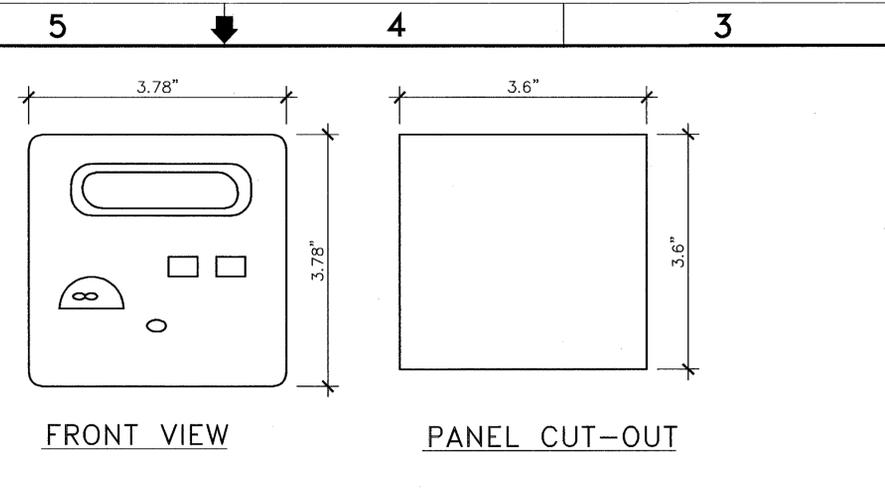
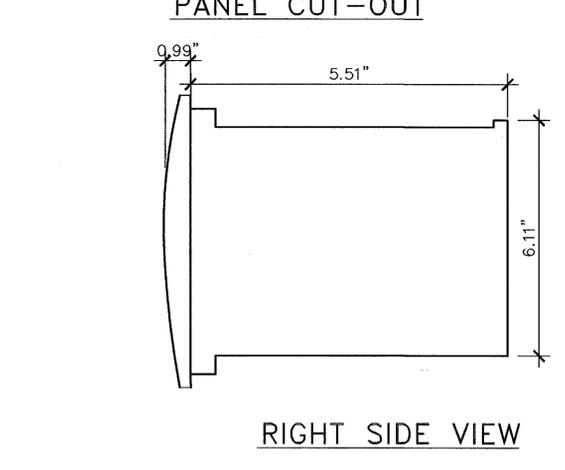
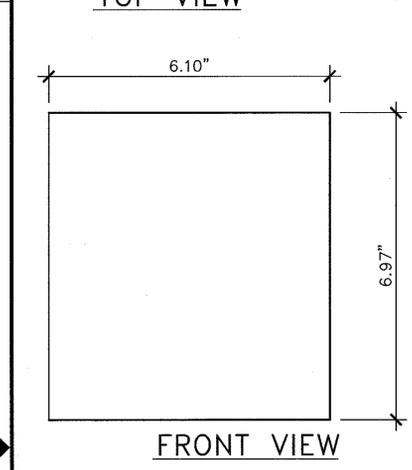
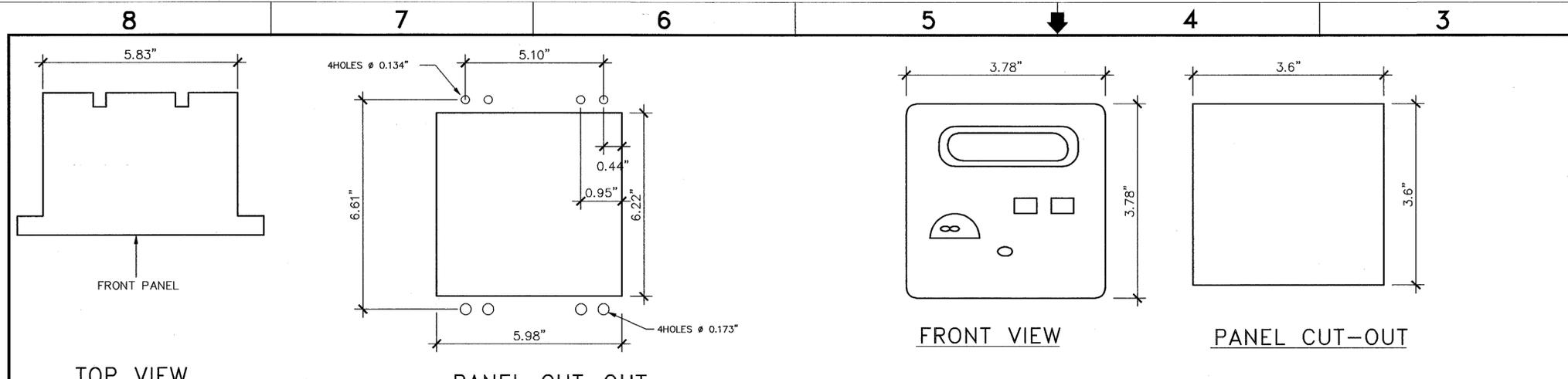
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SHEET NOTES

1. THESE DRAWING DETAILS AND DIMENSIONS ARE SHOWN FOR GUIDANCE ONLY. CONTRACTOR SHALL BE RESPONSIBLE TO CONFIRM AND PROVIDE DETAILED DRAWINGS FROM EQUIPMENT MANUFACTURER BASED ON ACTUAL EQUIPMENT SUPPLIED BEFORE INSTALLATION INTO EXISTING AND NEW EQUIPMENT.
2. INSTALL NEW GFE UPS UNIT FOR POWER METER INSIDE SWITCHGEAR.
3. FOR NAMEPLATE SCHEDULE, SEE DRAWING E80.

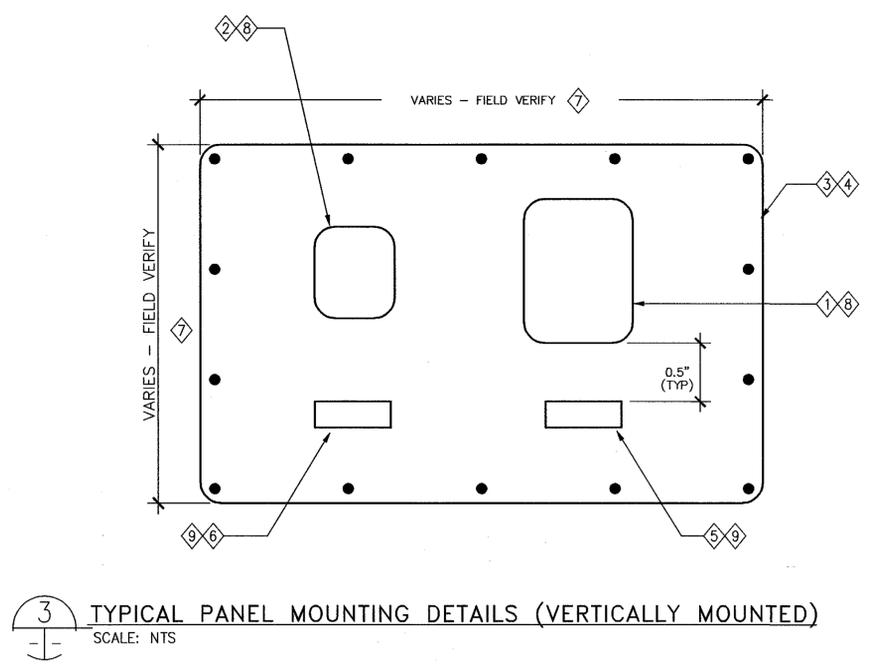
KEY NOTES

- ① OUTLINE OF NASA AMES STANDARD 3-PHASE MICROPROCESSOR BASED 50/51 ELECTRONIC RELAY UNIT, ALSTOM MICOM P124 (GOVERNMENT FURNISHED & CONTRACTOR INSTALLED EQUIPMENT).
- ② OUTLINE OF NASA AMES STANDARD DIGITAL 3-PHASE POWER METER, PML 10N7330 (GOVERNMENT FURNISHED AND CONTRACTOR INSTALLED EQUIPMENT).
- ③ PROVIDE NEW ONE-PIECE COVER PLATE WITH MOUNTING SCREWS, OF SUITABLE SIZE TO ADEQUATELY COVER THE EXISTING CUTOUT OPENINGS OF REMOVED RELAYS FROM THEIR RESPECTIVE EXISTING SWGR INSTRUMENT PANELS.
- ④ NEW COVER PLATE SHALL BE #10 GAUGE STEEL PLATE. PAINTED TO MATCH THE EXISTING OR NEW EQUIPMENT PAINT FINISH.
- ⑤ PROVIDE NEW IDENTIFICATION NAMEPLATE TO READ "3ø, 50/51 - 1, 2, 3 & N".
- ⑥ PROVIDE NEW IDENTIFICATION NAMEPLATE. SEE SPECIFICATION 26 23 00 FOR NAMEPLATE DETAILS.
- ⑦ EACH PIECE OF EXISTING EQUIPMENT IS DIFFERENT. CONTRACTOR SHALL FIELD VERIFY EACH PIECE OF EQUIPMENT TO DETERMINE COVER PLATE DIMENSIONS PRIOR TO FABRICATION. COVER PLATE SHALL BE LARGE ENOUGH TO COVER EXISTING RELAY OPENINGS OF REMOVED RELAYS AND ACCOMMODATE NEW DEVICES. COVER PLATE SHALL BE AS SYMMETRICAL AS POSSIBLE ON FRONT OF EQUIPMENT AND SHALL NOT HAVE ANY SHARP EDGES.
- ⑧ FOR NEW EQUIPMENT, CONTRACTOR SHALL PROVIDE NEW OPENINGS BASED ON DETAIL 1 AND 2 FOR DEVICE MOUNTING AND DEVICE NAMEPLATES.
- ⑨ EQUIPMENT/DEVICE NAMEPLATE SHALL BE IN ACCORDANCE WITH ELECTRICAL NOTE 11 ON DRAWING E1 SH. 1.



① 3-PHASE MICROPROCESSOR BASED ELECTRONIC RELAY INSTALLATION INFORMATION (FLUSH MOUNTING)
SCALE: NTS

② DIGITAL 3-PHASE (SEE SHEET NOTE 3) POWER METER INSTALLATION INFORMATION (FLUSH MOUNTING)
SCALE: NTS



③ TYPICAL PANEL MOUNTING DETAILS (VERTICALLY MOUNTED)
SCALE: NTS

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Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DESIGNED	R.NIZAMOY	DATE	4/30/09		
CHECKED	J.MCCUSKER	DATE	4/30/09		
PROJENGR	N.NIZAMOY	DATE	4/30/09		
REQUESTER	N.HSU	DATE	4/29/09		
R&QA		DATE			
SUPERVISOR	S.FRANKEL	DATE	4/29/09		

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
ELECTRICAL
TYPICAL RELAY UNITS PANEL MOUNTING DETAILS

SCALE: AS NOTED INDEX SHEET 1 OF 1

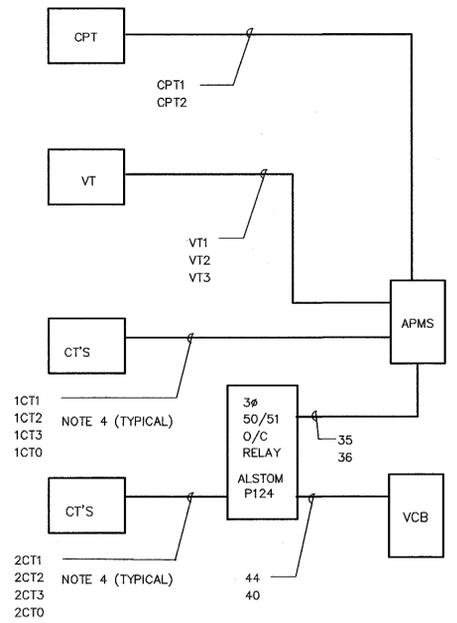
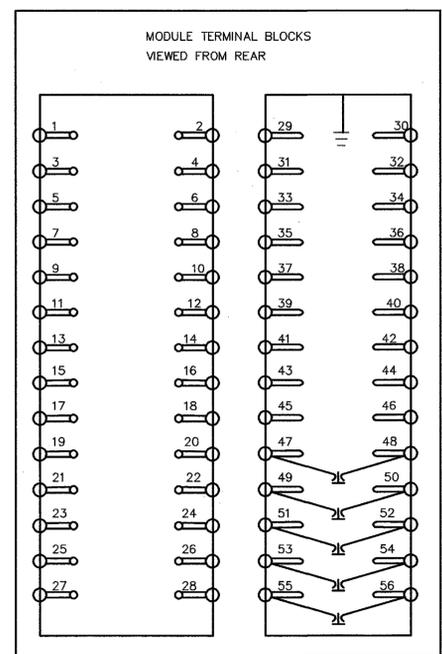
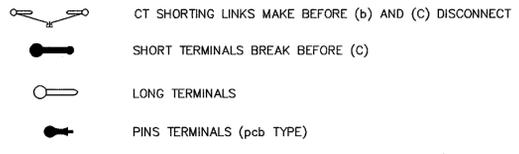
FILE NAME: A1---0810-E081-1_R8.DWG 4-30-09

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SHEET NOTES

- 50/51 RELAY SHALL BE GOVERNMENT FURNISHED & INSTALLED EQUIPMENT. THE RELAY SHALL BE THE NASA AMES STANDARD ALSTOM MODEL P124 MICROPROCESSOR BASED ELECTRONIC RELAY UNIT.
- RELAY TO BE MOUNTED AT FRONT PANEL IN NEW BREAKER CUBICLES, AS SHOWN ON THE DRAWINGS.
- TERMINALS 1-48, 50, 52 AND 54 CURRENT INPUTS SHALL BE WIRED/JUMPERED EXTERNALLY BY THE CONTRACTOR.
- WIRE NUMBERS SHALL CONSIST OF THE SUPPLY DEVICE/RELAY NUMBER AND A SEQUENTIAL NUMBER (1, 2, 3...) AS REQUIRED.

SHEET SYMBOLS



WIRE NUMBERING AND INTERCONNECTION BLOCK DIAGRAM

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Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

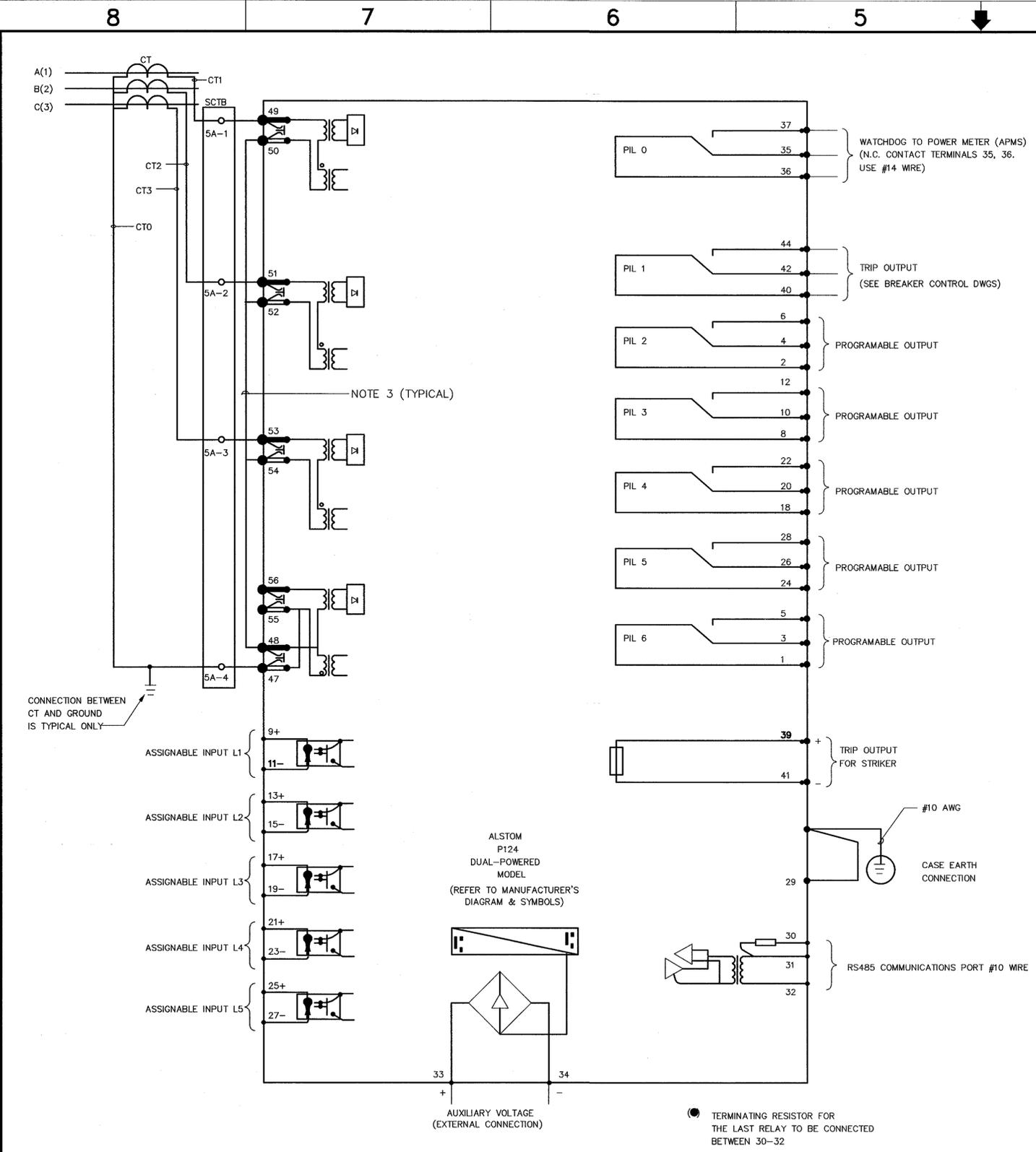
ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	R.NIZAMOVA	DATE	4/30/09
DESIGNED	N.NIZAMOVA	DATE	4/30/09
CHECKED	J.MCCUSKER	DATE	4/30/09
PROGRAM	N.NIZAMOVA	DATE	4/30/09
REQUESTER	N.HSU	DATE	4/30/09
R&QA		DATE	
SAFETY		DATE	
SUPERVISOR	S.FRANKEL	DATE	5/20/09

Ames Research Center
Moffett Field, California

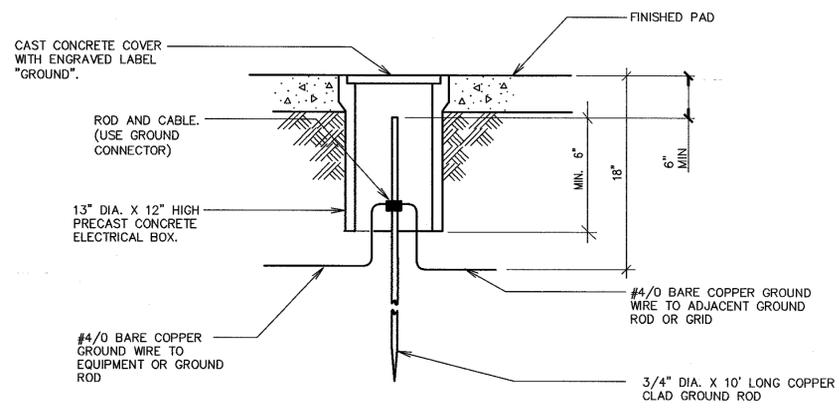
RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VII
ELECTRICAL
TYPICAL
50/51 RELAY WIRING AND
INTERCONNECTION DIAGRAM

SIZE D CAGE CODE 25307
SCALE: AS NOTED INDEX SHEET 1 OF 1

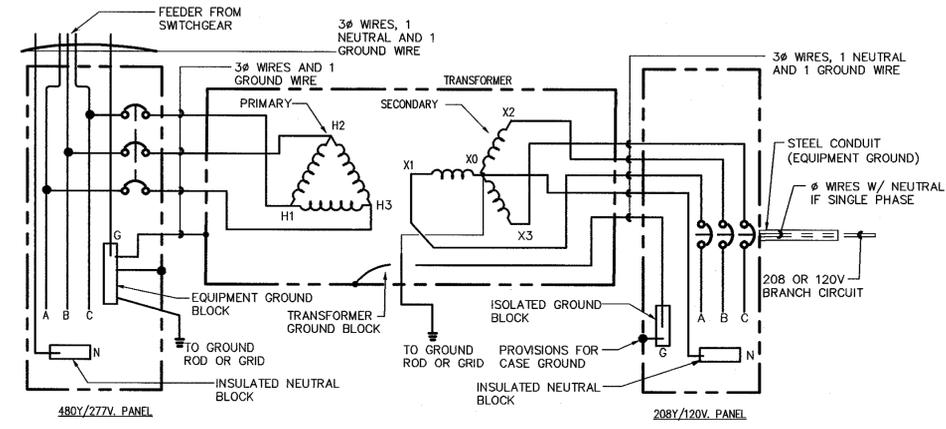


ALSTOM MICOM P124
50/51 RELAY WIRING DIAGRAM
SCALE: N.T.S.

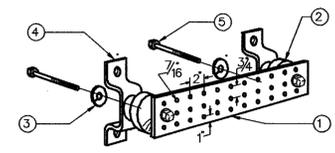
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 DATE: Apr 29, 2009 - 9:27:34 am Images: \\F:\19-n\3\cadd\ARC\REDS\Phase VII\500_CAD\60046720.0001_FY08 - Consolidation folder\General\Sheet\A1---0810-E82_1_RB.dwg
 Xrefs: \\F:\19-n\3\cadd\ARC\REDS\Phase VII\500_CAD\60046720.0001_FY08 - Consolidation folder\General\Sheet\A1---0810-E82_1_RB.dwg



1 DETAIL-GROUND WELL SCALE: 1"=1'-0"

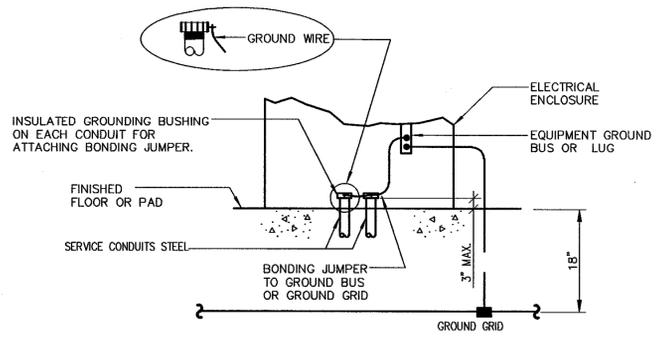


2 TRANSFORMER GROUNDING SYSTEM WIRING DIAGRAM SCALE: 1"=1'-0"

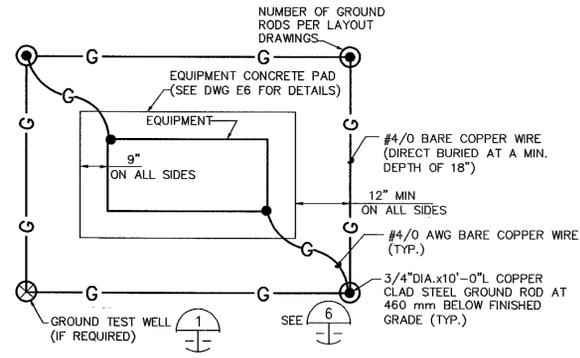


- NOTES:
- A. PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR
 - 1. COPPER GROUND BAR, 1/4" X 4" X 20", NEWTON INSTRUMENT CO. CAT. NO. B-6142 (OR EQUAL). HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
 - 2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4 (OR EQUAL).
 - 3. 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8 (OR EQUAL).
 - 4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT. NO. A-6056 (OR EQUAL).
 - 5. 5/8-11 X 1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT. NO. 3012-1 (OR EQUAL).
 - B. PROVIDE #4/0 BARE CU. WIRE WITH NEMA 2-HOLE CONNECTOR FROM MAIN BUILDING GROUND (MBG) BUS BAR TO MAIN COMPUTER GROUND (MCG) BUS BAR

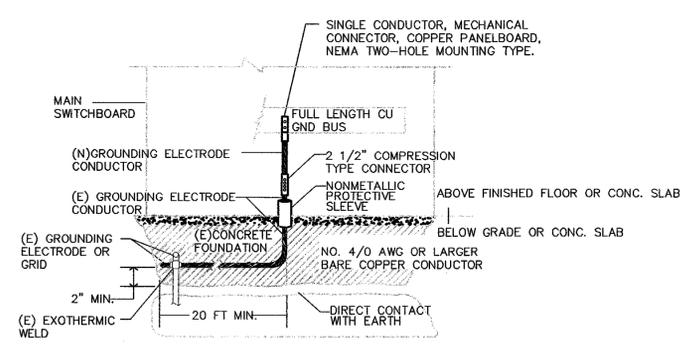
3 GROUND BUS BAR DETAIL SCALE: 3"=1'-0"



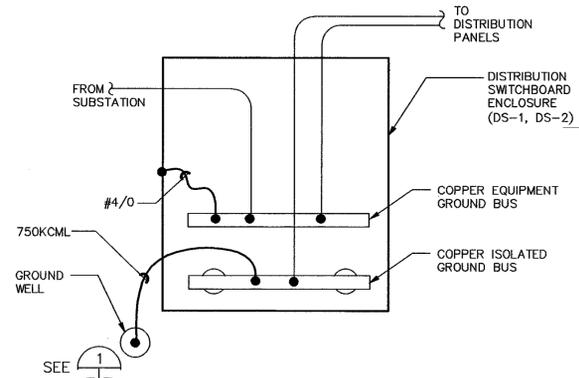
4 (TYPICAL FOR BOXES, CABINETS) CONDUIT GROUND CONNECTION DETAIL SCALE: 1"=1'-0"



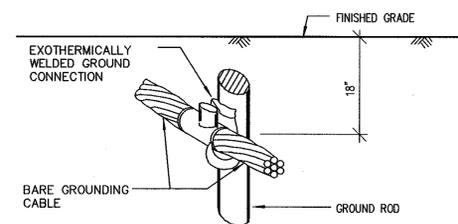
5 TYPICAL - NEW PAD MOUNTED EQUIPMENT GROUNDING DETAILS SCALE: 6"=1'-0"



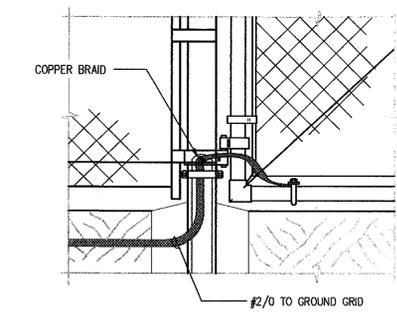
6 GROUND BUS BAR DETAIL SCALE: 3"=1'-0"



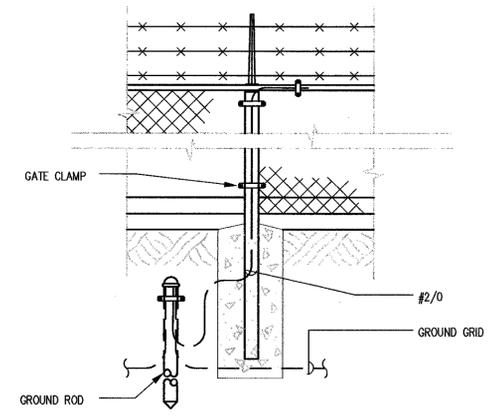
7 TYPICAL DISTRIBUTION SWITCHBOARD GROUNDING DETAIL SCALE: NTS



8 DETAIL-GROUND CABLE CONNECTION TO GROUND ROD SCALE: 1"=1'-0"



9 GATE GROUNDING DETAIL SCALE: 1"=1'-0"



10 FENCE GROUNDING DETAIL SCALE: 1"=1'-0"

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DRAWN: R. NIZAMOVA DESIGNED: N. NIZAMOVA CHECKED: J. McCUSKER PROJ. MGR: N. NIZAMOVA REQUESTER: N. HSU R&QA: [Signature] SAFETY: [Signature] SUPERVISOR: S. FRANKEL					
DATE: 4/30/09 DATE: 4/30/09 DATE: 4/30/09 DATE: 4/30/09 DATE: 4/30/09 DATE: 5-5-09					
Ames Research Center Moffett Field, California RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII ELECTRICAL TYPICAL GROUNDING DETAILS					
SIZE	D	CAGE CODE	25307	SCALE	AS NOTED
FILE NAME:	A1---0810-E83_1.RR.DWG				
SHEET	1	OF	1	DATE	4-30-09

DWG: \\F:\19-n\3\code\ARC\REDS\REDS Phase VIII\500_CAD\60046720\000_1_PY08 - Consolidation folder\General\Sheet\A1---0810-E83_1_RR.dwg User: polden
 DATE: Apr 29, 2009 - 9:27:37 am Images:
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DWG NO. A1---0810---E84

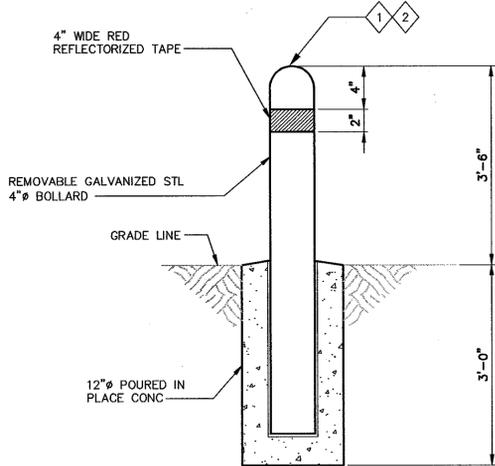
SHT 1 REV

SHEET NOTES

- 1. FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS, SEE DRAWING G4.
- 2. FOR STRUCTURAL GENERAL NOTES SEE S1.

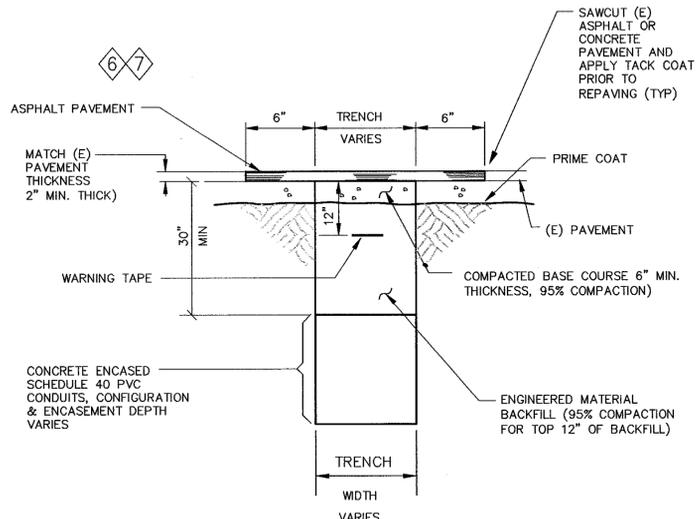
KEY NOTES

- 1 THE 4" IRON PIPE SHALL BE COATED WITH ZINCHROMATE PRIMER BEFORE INSTALLATION AND PAINTED YELLOW.
- 2 SPACING BETWEEN BOLLARDS SHOWN ON THE LAYOUT DRAWINGS SHALL BE 60", MAXIMUM.
- 3 TRENCH SHALL BE CUT AS A GENERAL RULE A MINIMUM OF 6" WIDER THAN NEEDED FOR CONDUIT/DUCTBANK.
- 4 METALLIC FOIL BRIGHT YELLOW WARNING TAPE.
- 5 MINIMUM OF 3" OF CONCRETE COVER SHALL BE PROVIDED ON REBARS.
- 6 RESTORE FINISHED GRADE TO ITS ORIGINAL CONDITION AFTER DUCT BANK INSTALLATION IS COMPLETED.
- 7 PERMANENT TRENCH PATCH SHALL EXTEND A MINIMUM OF 12" BEYOND THE EDGE OF TRENCH, IF EDGE OF TRENCH IS WITHIN 36" OF THE EDGE OF THE PAVEMENT, EXTEND PERMANENT PATCH TO THE ORIGINAL PAVEMENT EDGE.

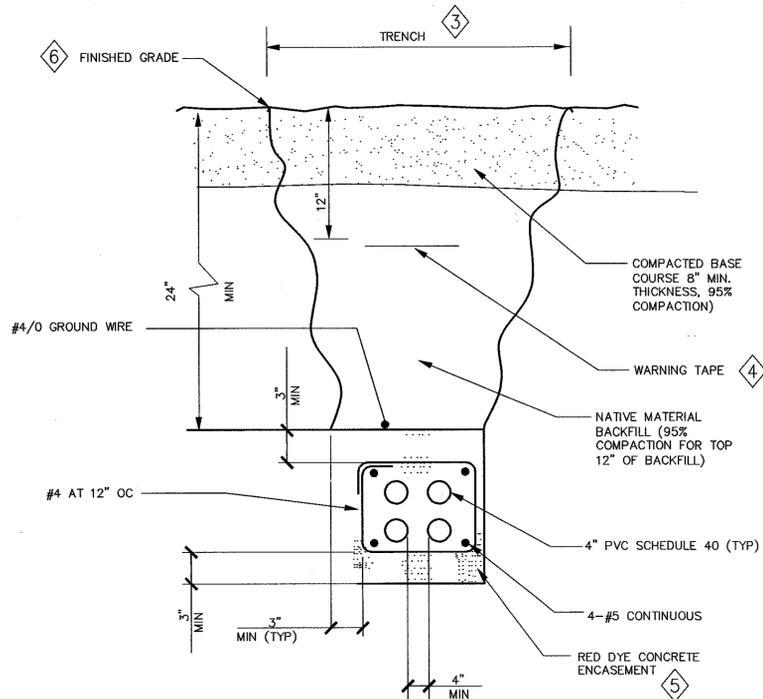


NOTE: THE 4" IRON PIPE SHALL BE PAINTED TRAFFIC YELLOW

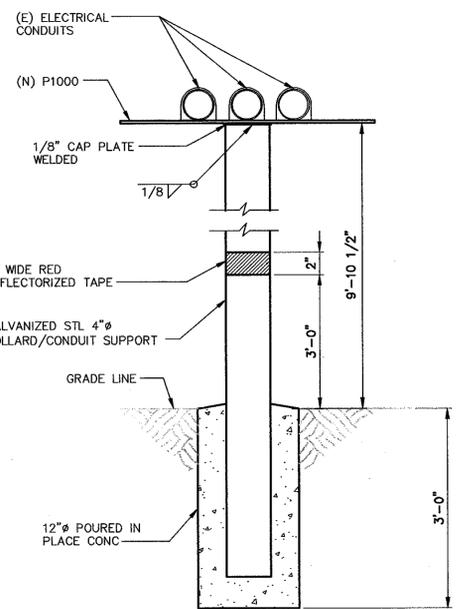
1 TYPICAL-REMOVABLE BOLLARD DETAIL
SCALE: 1 1/2" = 1'-0"



2 TYPICAL TRENCH DETAIL
NTS



3 DUCTBANK SECTION W/ FOUR CONDUITS
NTS



NOTE: THE 4" IRON PIPE SHALL BE PAINTED TRAFFIC YELLOW FOR 3'-6" ABOVE GROUND.

4 BOLLARD/CONDUIT SUPPORT DETAIL FOR N221 SUBSTATION
SCALE: 1 1/2" = 1'-0"

Approved for Construction
Moffett Field Permit Board
P. S. Sibley
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD

DATE	BY	DESCRIPTION
4/30/09	<i>[Signature]</i>	DESIGNED
4/30/09	<i>[Signature]</i>	CHECKED
4/30/09	<i>[Signature]</i>	PROJ.MGR
4/30/09	<i>[Signature]</i>	REQUESTER
4/30/09	<i>[Signature]</i>	R&QA

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM--PHASE VIII
ELECTRICAL

**TYPICAL
MISCELLANEOUS
DETAILS**

SAFETY	DATE	SIZE	CAGE CODE	INDEX	SHEET	OF	REV
		D	25307		1	OF	1

FILE NAME: A1---0810---E084_1_R8.DWG 4-30-09

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DWC: \\F:\19-mt3\cadd\ARC\REDS\Phase VIII\500_CAD\60046720\001_FY08 - Consolidation Folder\General\Sheet\A1---0810---E084_1_R8.dwg User: pdalen
DATE: Apr 29, 2009 - 9:27:41 am Images:
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DWG NO. A1---0810-E85

SHT 1 REV 1

SHEET NOTES

1. FOR GENERAL CONSTRUCTION NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWING G4.

KEY NOTES:

- ① INSTALLATION OF GFE EQUIPMENT, TO BE MOUNTED ON SWITCHGEAR, SHALL BE IN ACCORDANCE WITH DRAWING E81.
- ② EQUIPMENT/DEVICE NAMEPLATES SHALL BE IN ACCORDANCE WITH ELECTRICAL NOTE 11 ON DRAWING E1 AND PER DRAWING E80.

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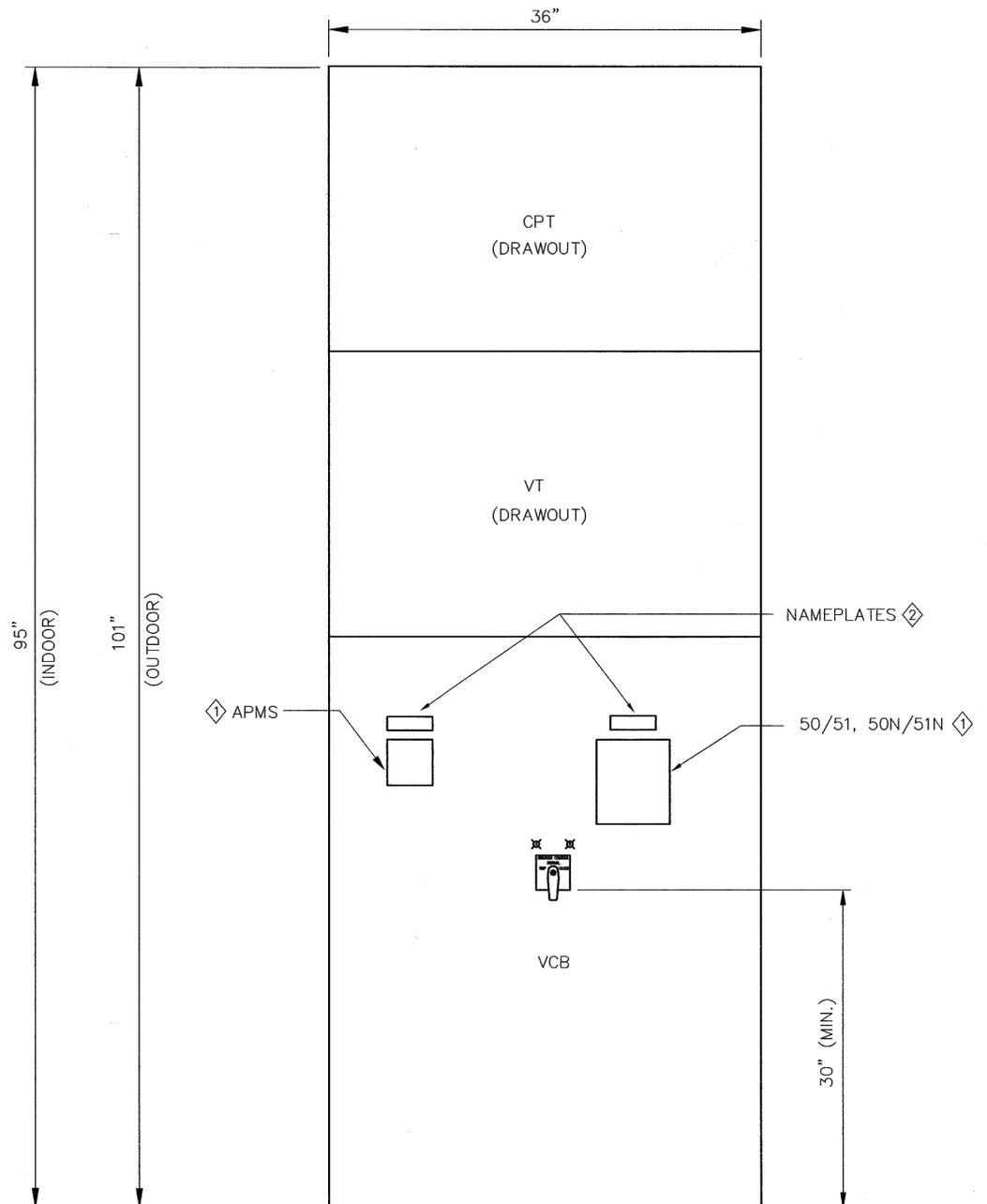
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② NEW SWITCHGEAR ELEVATION
 SCALE: NTS (INTERIOR VIEW WITH WEATHERTIGHT DOOR OPEN) (TYPICAL)

Approved for Construction
 Moffett Field Permit Board
[Signature]
 Chief Building Official
 Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN R.NIZAMOVA	DATE 4/30/09
DESIGNED N.NIZAMOVA	DATE 4/30/09
CHECKED J.MCCUSKER	DATE 4/30/09
PROMGR N.NIZAMOVA	DATE 4/30/09
REQUESTER N.HSU	DATE 4/30/09
R&QA	DATE
SAFETY	DATE
SUPERVISOR S.FRANKEL	DATE 5-7-09

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM--PHASE VII
ELECTRICAL

**TYPICAL
MISCELLANEOUS INSTALLATION
DETAILS**

SIZE D	CAGE CODE 25307	INDEX	SHEET 1 OF 1
SCALE: AS NOTED	FILE NAME: A1---0810-E85_1_RB.DWG	DATE 4-30-09	

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4-30-09

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 DATE: Apr 29, 2009 9:27:45 am Images:
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 Version: 17.1s (LMS Tech)

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DWG NO. A1---0810-E86

SHT 1 REV

SHEET NOTES

1. PROVIDE CABLE RACKS, CABLE RACK ARMS AND CABLE INSULATORS IN EACH MANHOLE AND/OR VAULT FOR SUPPORT OF NEW CABLE. THE EXACT NUMBER AND CONFIGURATION OF RACKS REQUIRED TO BE DETERMINED BY THE CONTRACTOR IN THE FIELD BASED ON EXISTING CONDITIONS, SEE GENERAL PROJECT NOTE 21 AND ELECTRICAL NOTE 19 ON DRAWING G4. CABLE RACKS SHALL BE INSTALLED AT LEAST (2) ON EACH SIDE, OR (3) EACH WHEREVER A CABLE SPLICE IS MADE OR ON LONGER WALL.

KEY NOTES

- ① ROUTE NEW CABLE THE LONG DISTANCE AROUND THE MANHOLE TAKING ADVANTAGE OF THE MINIMUM INTERFERENCE FROM EXISTING CABLES, SPLICES AND EQUIPMENT WITHIN THE MANHOLE.
- ② PROVIDE 2" CABLE RACK CHANNELS.
- ③ EACH CABLE INSULATOR SHOWN REPRESENTS SPACE ALLOCATION FOR 3-1/C #500KCMIL AND 1 #4/0 GND OR 3-1/C #350KCMIL AND 1 #4/0 GND AS SHOWN ON THE LAYOUT DRAWINGS.

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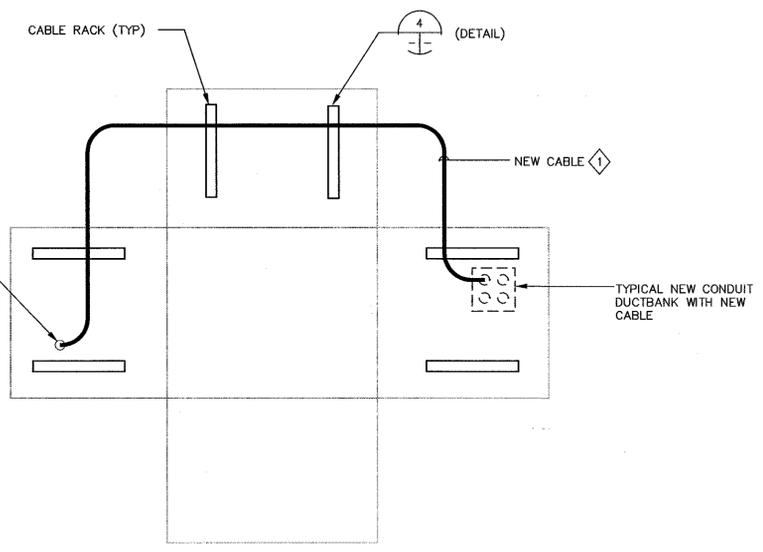
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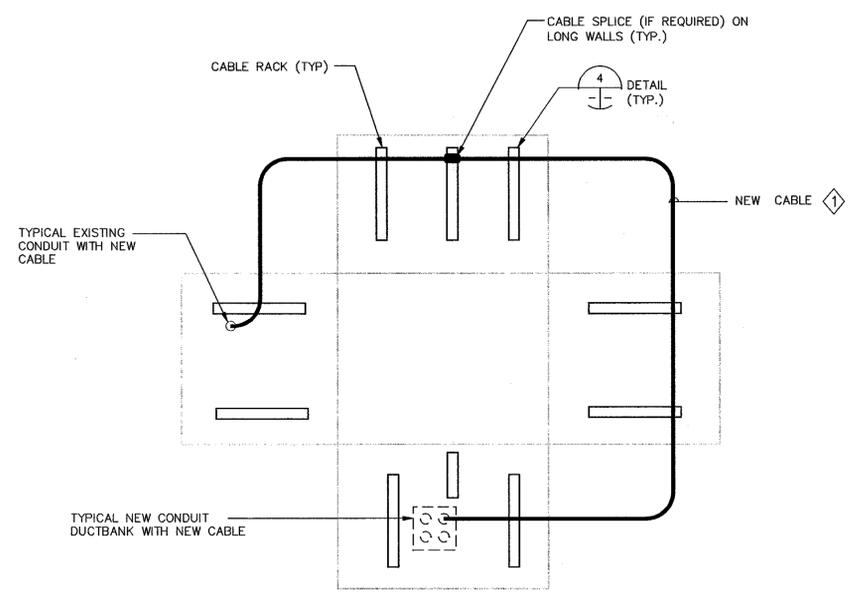
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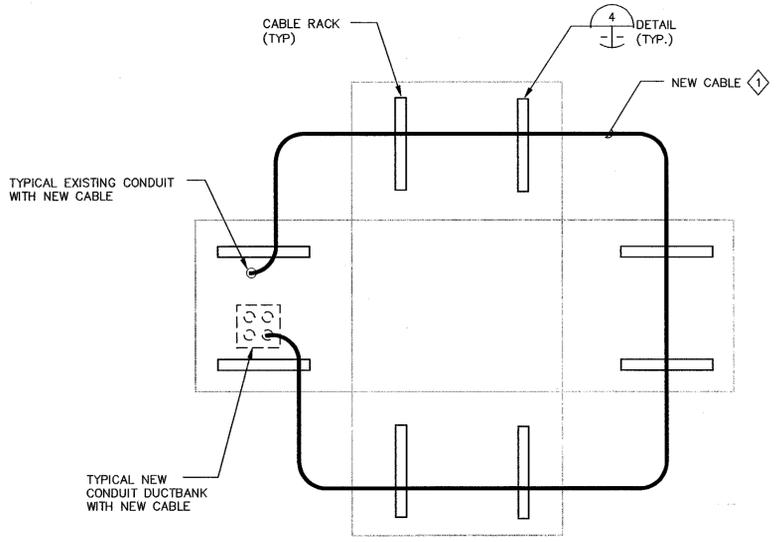
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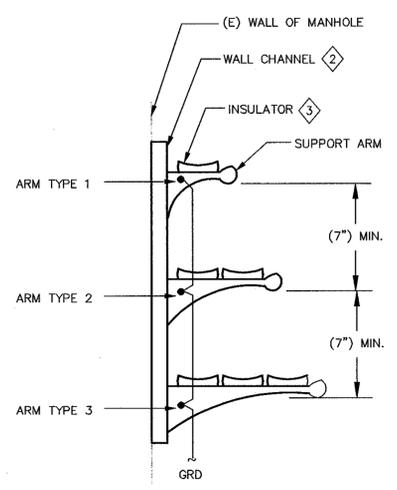
① TYPICAL MH STRAIGHT CABLE ROUTING SCALE: NTS



② TYPICAL MH 270° CABLE ROUTING SCALE: NTS



③ TYPICAL MH 360° CABLE ROUTING SCALE: NTS



④ TYPICAL MULTIPLE CABLE RACK INSTALLATION SCALE: NTS (SEE NOTE 1)

Approved for Construction
Moffett Field Permit Board
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN R. NIZAMOVA	DATE 4/30/09
DESIGNED N. NIZAMOVA	DATE 4/30/09
CHECKED J. MCCUSKER	DATE 4/30/09
PROJECTOR N. NIZAMOVA	DATE 4/30/09
REQUESTER N. HSU	DATE 4/30/09
R&QA	DATE
SAFETY	DATE
SUPERVISOR S. FRANKEL	DATE 5-9-09

Ames Research Center Moffett Field, California	
RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM—PHASE VIII ELECTRICAL	
TYPICAL CABLE ROUTING DETAILS	
SIZE D	CAGE CODE 25307
SCALE AS NOTED	INDEX
SHEET 1 OF 1	

FILE NAME:
A1---0810-E86_1_R8.DWG 4-30-09

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DWG NO. A1---0810-S7 SHT 1 REV 1

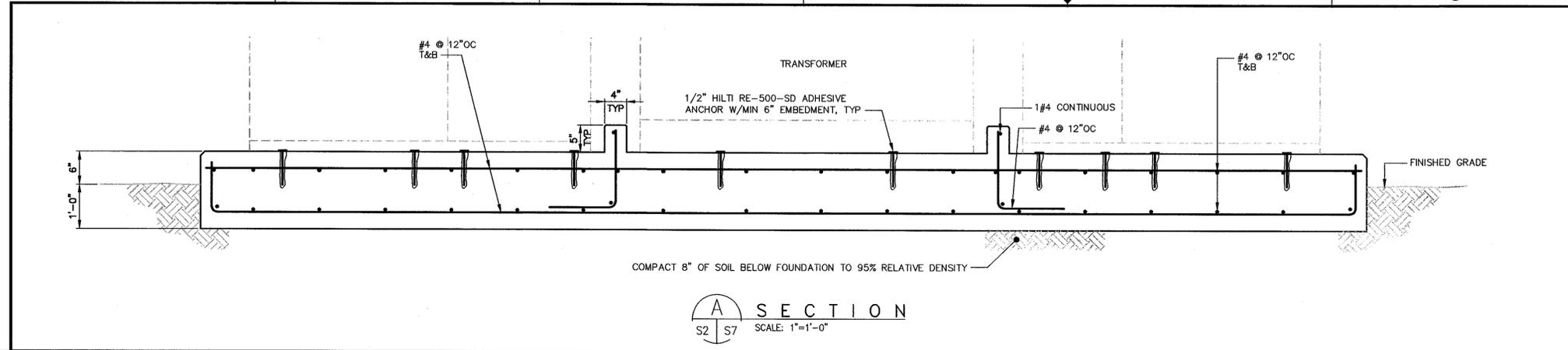
SHEET NOTES

1. FOR STRUCTURAL GENERAL NOTES SEE SHET S1.

KEY NOTES

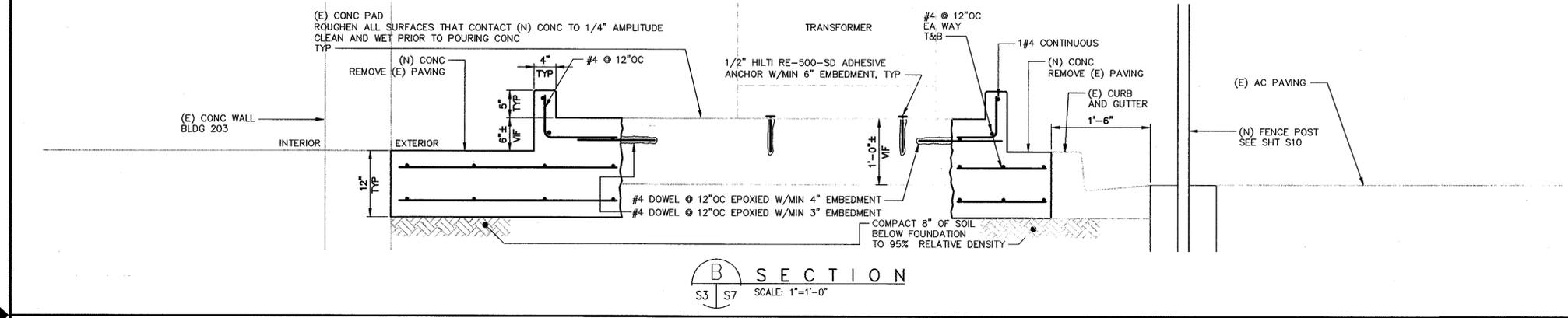
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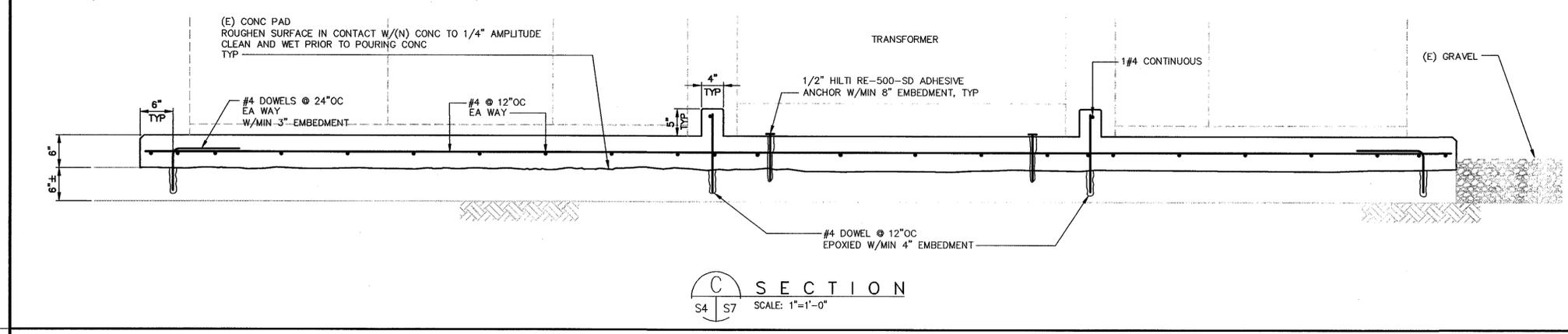
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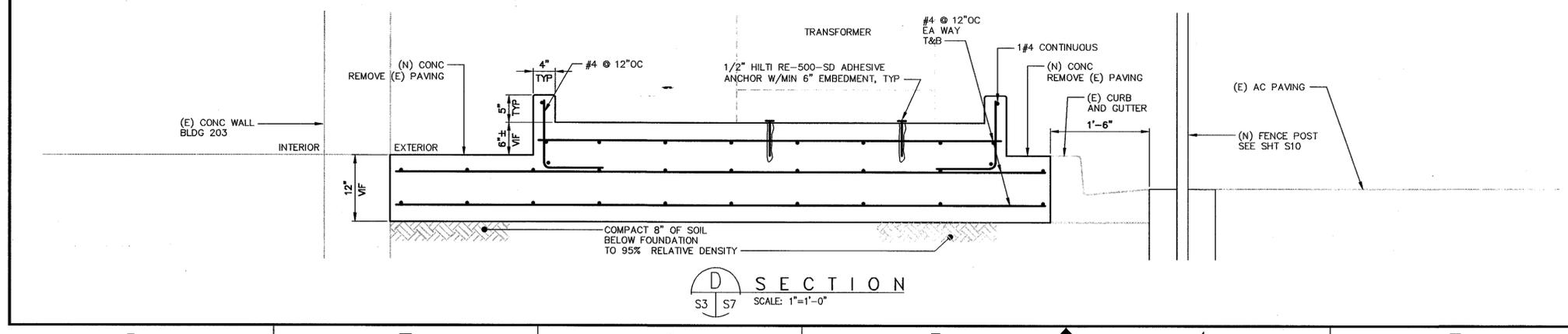
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FILE NAME: A1---0810-S007_1_RB.DWG 4-30-09

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Approved for Construction
Moffett Field Permit Board
Peter Loh
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DRAWN: P.ALDEN DATE: 4/30/09					
DESIGNED: A.FIROUZI DATE: 4/30/09					
CHECKED: M.CUSTER DATE: 4/30/09					
PROJ. NO.: N.NIZAMOVA DATE: 4/30/09					
REQUESTER: N.HSU DATE: 4/30/09					
R&QA: DATE: 4/30/09					
SAFETY: DATE: 4/30/09					
SUPERVISOR: S.FRANKEL DATE: 5-5-09					
SIZE	CAGE CODE	REV			
D	25307	A1---0810-S7			
SCALE: AS SHOWN	INDEX	SHEET 1 OF 1			

Ames Research Center
Moffett Field, California
RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM--PHASE VII
STRUCTURAL

SECTIONS

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DWG NO. A1---0810-S8

SHT 1 REV

SHEET NOTES

1. FOR STRUCTURAL GENERAL NOTES SEE SHEET S1.

KEY NOTES

(E) CONC PAD
ROUGHEN ALL SURFACES THAT CONTACT (N) CONC TO 1/4" AMPLITUDE
CLEAN AND WET PRIOR TO POURING CONC
TYP

TRANSFORMER

#4 @ 12" OC
EA WAY
#4 @ 12" OC
EPOXIED DOWELS
W/4" EMBEDMENT
1#4 CONTINUOUS

TRANSFORMER

#4 @ 12" OC
EA WAY
#4 @ 12" OC
EPOXIED DOWELS
W/2 1/2" EMBEDMENT
1#4 CONTINUOUS

1/2" HILTI RE-500-SD ADHESIVE
ANCHOR W/MIN 6" EMBEDMENT, TYP

(E) CONC

6" TYP

A SECTION
S2 S7 SCALE: 1"=1'-0"

Approved for Construction
Moffett Field Permit Board

[Signature]
Chief Building Official

Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN	P.A.	DATE	4/30/09
DESIGNED	A.FIROUZI	DATE	4/30/09
CHECKED	M. CLUSTER	DATE	4/30/09
PROJ.MGR	N. NIZAMOVA	DATE	4/30/09
REQUESTER	N. NIZAMOVA	DATE	4/30/09
SAFETY		DATE	

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM--PHASE VIII
STRUCTURAL

SECTIONS

SUPERVISOR	S. FRANKEL	DATE	5/1/09	SIZE	D	CAGE CODE	25307	SCALE	AS SHOWN	INDEX		SHEET	1 OF 1
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FILE NAME: A1---0810-S008_1.R8.DWG 4-30-09

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DATE: Apr 29, 2009 - 9:27:54 am Images: \\f19-r13\cadd\ARC\VEDS\REDS\Phase VIII\500_CAD\60046720.0001_FY08 - Consolidation folder\General\Sheet\A1---0810-S008_1.R8.dwg
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DWG NO. A1---0810-S9

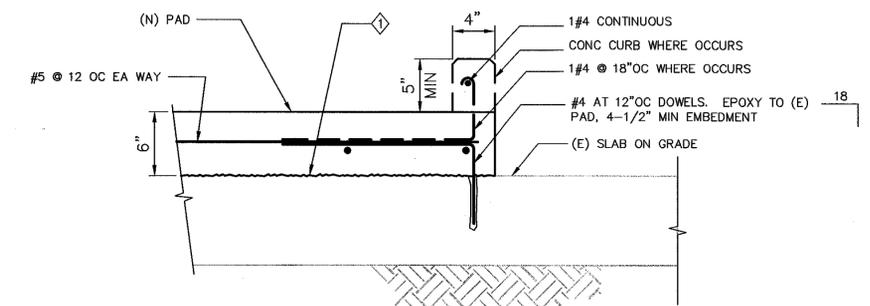
SHT 1 REV

SHEET NOTES

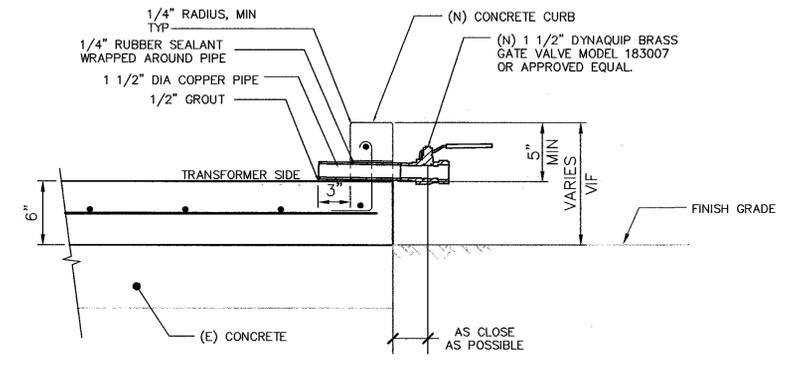
1. FOR STRUCTURAL NOTES, SEE SHEET S1.

KEY NOTES

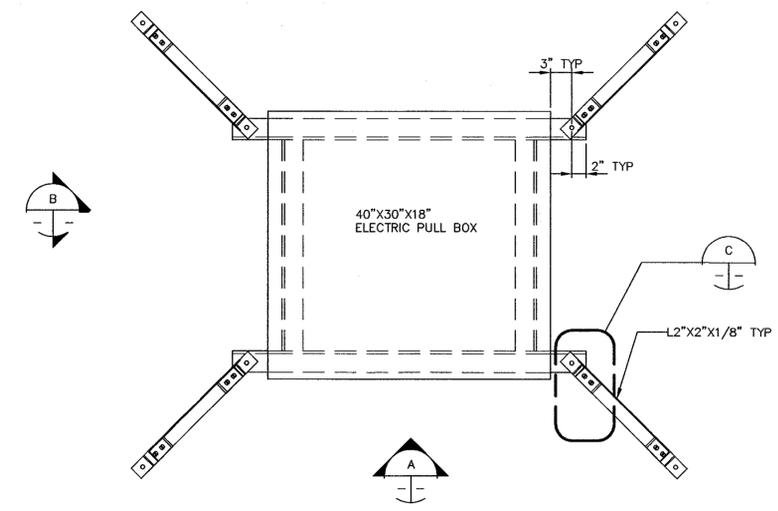
ROUGHEN THE SURFACE OF (E) CONC. SLAB ON GRADE PRIOR OF POURING NEW CONC.



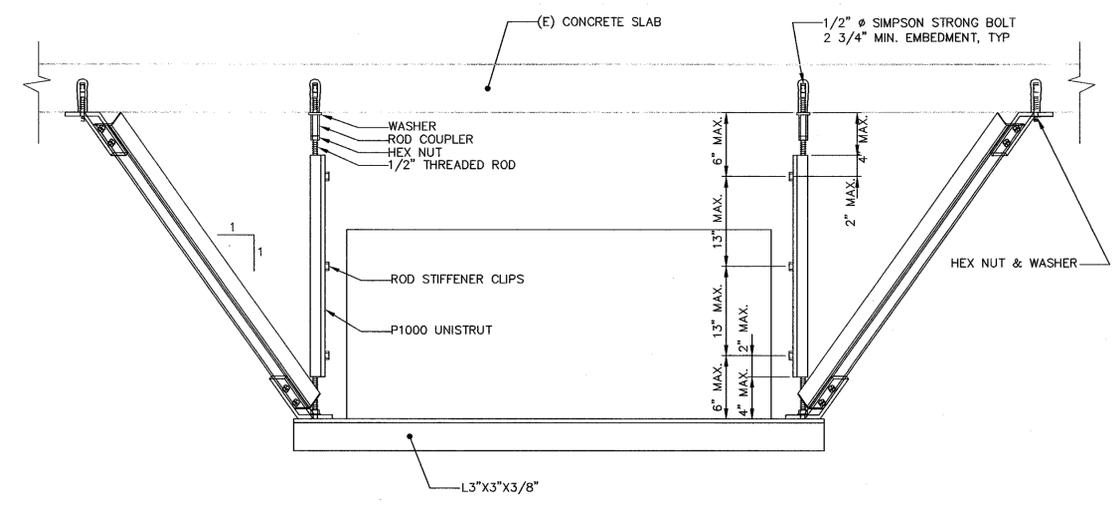
1 TYPICAL (N) PAD INSTALLED ON TOP OF (E) CONC. PAD
S2,S3,S4,S5,S6 S9 SCALE: 1 1/2"=1'-0"



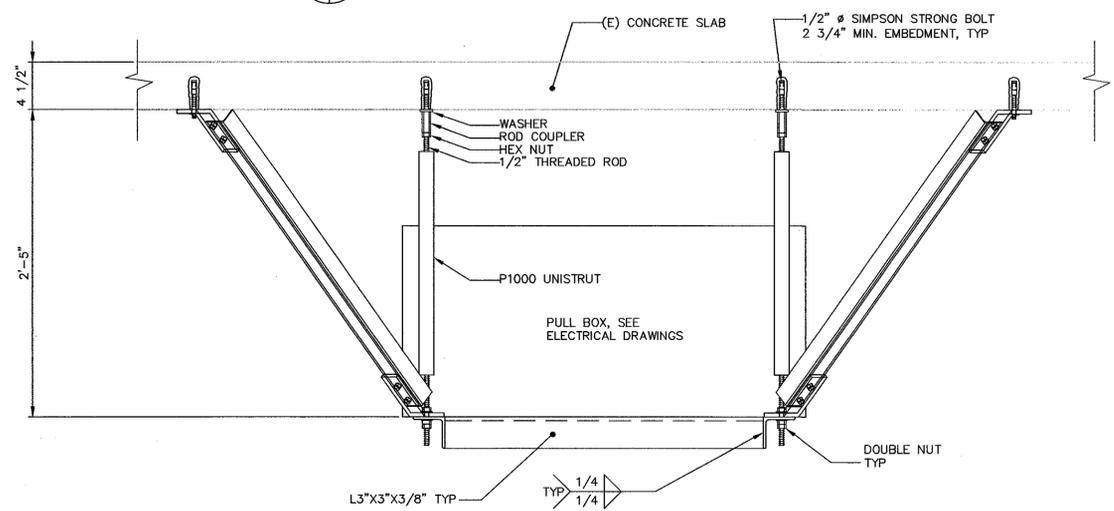
2 TYPICAL DRAIN OPENING
S2,S3,S4,S5,S6 S9 SCALE: 1 1/2"=1'-0"



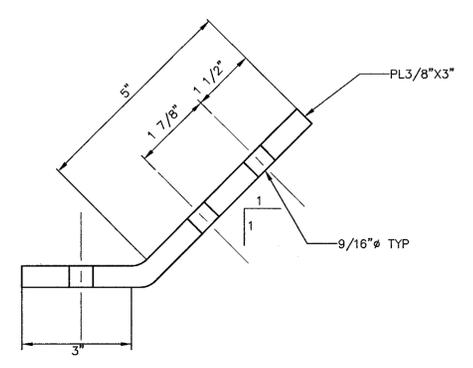
NOTE: CONDUITS NOT SHOWN FOR CLARITY. SEE ELECTRICAL DRAWINGS.
3 PULL BOX MOUNTING DETAIL
S2 S9 SCALE: 1"=1'-0"



NOTE: CONDUITS NOT SHOWN FOR CLARITY. SEE ELECTRICAL DRAWINGS.
A ELEVATION DETAIL
SCALE: 1 1/2"=1'-0"



NOTE: CONDUITS NOT SHOWN FOR CLARITY. SEE ELECTRICAL DRAWINGS.
B ELEVATION DETAIL
SCALE: 1 1/2"=1'-0"



C SEISMIC BRACKET
SCALE: 6"=1'-0"

Approved for Construction
Moffett Field Permit Board
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					

DRAWN E. RONALDI	DATE 4/30/09
DESIGNED A. FIROUZ	DATE 4/30/09
CHECKED M. MUSTER for Mike Muste	DATE 4/30/09
PROJMR N. NIZAMOVA	DATE 4/30/09
REQUESTER N. HSU	DATE 4/30/09
R&GA	DATE
SAFETY	DATE
SUPERVISOR S. FRANKEL	DATE 7-5-09

Ames Research Center
Moffett Field, California

RESTORATION OF ELECTRICAL DISTRIBUTION SYSTEM-PHASE VIII
STRUCTURAL

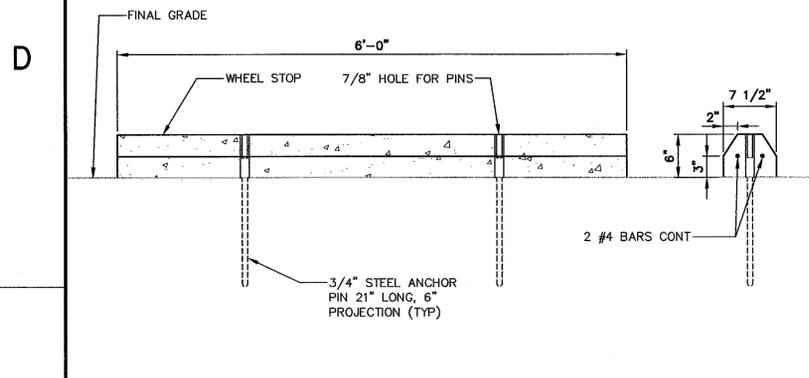
DETAILS

SIZE D	CAGE CODE 25307	SCALE: AS SHOWN	INDEX	SHEET 1 OF 1
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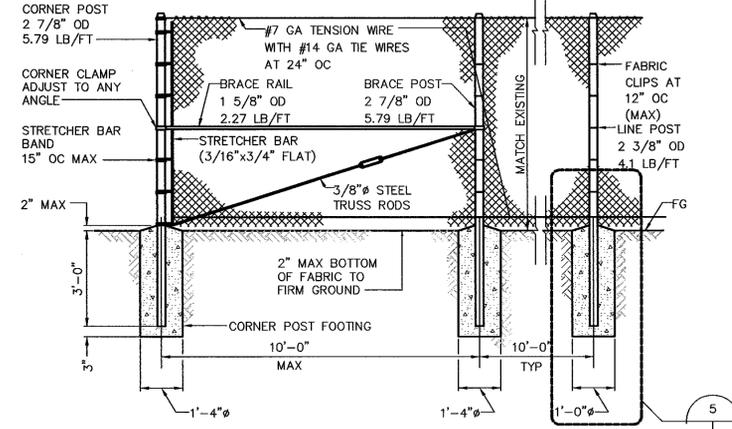
FILE NAME:
A1---0810-S009_L1_R8.DWG 4-30-09

D:\F019-m\3\code\ARC\REDS\REDS Phase VIII\500_CAD\60046720.0001_P708 - Consolidation folder\General\3\Sheet\A1---0810-S009_L1_R8.dwg User: polden Version: 17.1s (LUS Tech) Xrefs: \\F019-m\3\code\ARC\REDS\REDS Phase VIII\500_CAD\60046720.0001_P708 - Consolidation folder\General\3\Sheet\A1---0810-S009_L1_R8.dwg

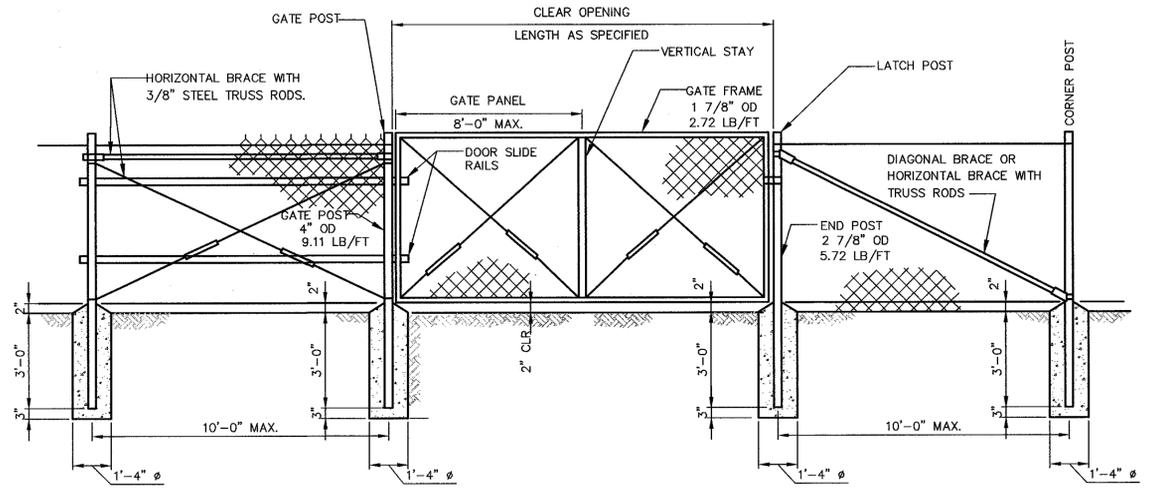
60046720.0001



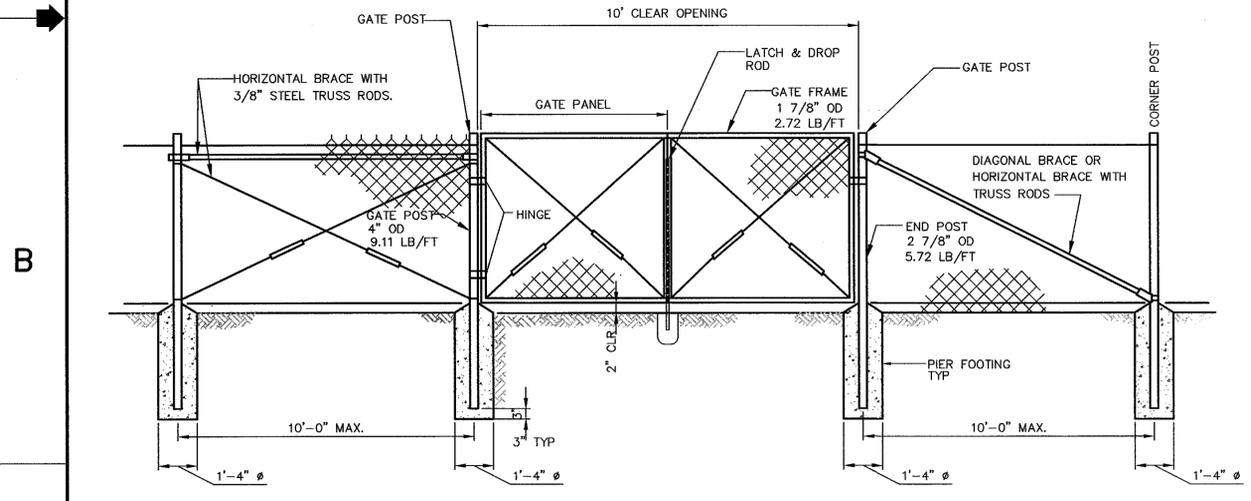
1 TYPICAL PARKING BUMPER
SCALE: 1"=1'-0"



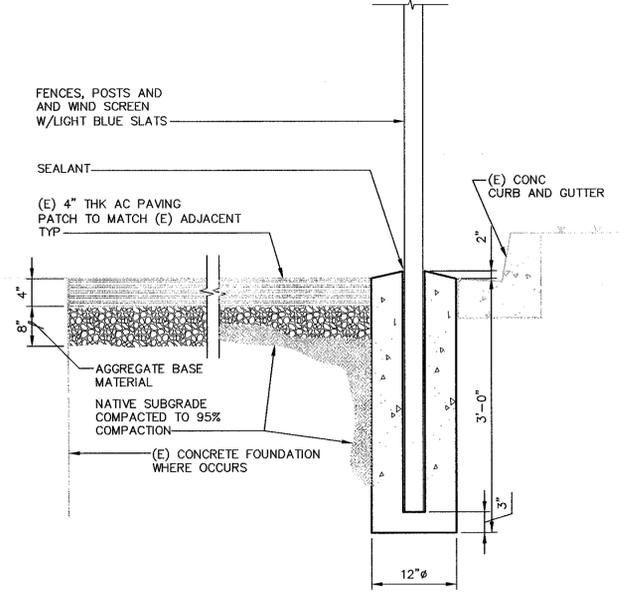
2 CHAIN LINK FENCE
NOT TO SCALE



3 SLIDING GATE ASSEMBLY DETAIL
NOT TO SCALE



4 DOUBLE LEAF GATE ASSEMBLY DETAIL
NOT TO SCALE



5 TYPICAL PIER FOOTING
NOT TO SCALE

Approved for Construction
Moffett Field Permit Board
[Signature]
Chief Building Official
Permit No. 09Q038

ZONE	LETTER	DESCRIPTION	DRAWN	DATE	APPRVD
REVISIONS					
DESIGNED	F. BONALDI	DATE	4-30-09		
CHECKED	A. FIROUZ	DATE	4/30/09		
PROJNGR	M. CLUSTER	DATE	4/30/09		
REQUESTER	N. NIZAMOVA	DATE	4/30/09		
R&QA	N. HSU	DATE	4/30/09		
SUPVISOR	S. FRANKEL	DATE	5-1-09		
SIZE		CAGE CODE	REV		
D		25307	A1---0810-S10		
SCALE		AS SHOWN	SHEET 1 OF 1		
FILE NAME: A1---0810-S010_1_R8.DWG 4-30-09					

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 DATE: Apr 29, 2009 - 10:25:39 am
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60046720.0001